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(21) International Application Number: PCT/US00/05308 (22) International Filing Date: 15 February 2000 (15.02.00) (30) Priority Data: <table border="0"> <tr> <td>09/285,480</td> <td>2 April 1999 (02.04.99)</td> <td>US</td> </tr> <tr> <td>09/339,338</td> <td>23 June 1999 (23.06.99)</td> <td>US</td> </tr> <tr> <td>09/389,681</td> <td>2 September 1999 (02.09.99)</td> <td>US</td> </tr> <tr> <td>09/433,826</td> <td>3 November 1999 (03.11.99)</td> <td>US</td> </tr> </table> (71) Applicant (for all designated States except US): CORIXA CORPORATION [US/US]; 1124 Columbia Street, Suite 200, Seattle, WA 98104 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): YUQIU, Jiang [CN/US]; 5001 South 232nd Street, Kent, WA 98032 (US). DILLON, Davin, C. [US/US]; 21607 N.E. 24th Street, Redmond, WA 98053 (US). MITCHAM, Jennifer, Lynn [US/US]; 16677 Northeast 88th Street, Redmond, WA 98052 (US). XU, Jiangchun [US/US]; 15805 S.E. 43rd Place, Bellevue, WA 98006 (US). HARLOCKER, Susan, L. [US/US]; 1124 Columbia Street, Suite 200, Seattle, WA 98104 (US).	09/285,480	2 April 1999 (02.04.99)	US	09/339,338	23 June 1999 (23.06.99)	US	09/389,681	2 September 1999 (02.09.99)	US	09/433,826	3 November 1999 (03.11.99)	US	(74) Agents: MAKI, David, J. et al.; Seed Intellectual Property Law Group PLLC, Suite 6300, 701 Fifth Avenue, Seattle, WA 98104-7092 (US). (81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>Without international search report and to be republished upon receipt of that report.</i>
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09/433,826	3 November 1999 (03.11.99)	US											
(54) Title: COMPOSITIONS FOR THE TREATMENT AND DIAGNOSIS OF BREAST CANCER AND METHODS FOR THEIR USE (57) Abstract <p>Compositions and methods for the therapy and diagnosis of cancer, such as breast cancer, are disclosed. Compositions may comprise one or more breast tumor proteins, immunogenic portions thereof, or polynucleotides that encode such portions. Alternatively, a therapeutic composition may comprise an antigen presenting cell that expresses a breast tumor protein, or a T cell that is specific for cells expressing such a protein. Such compositions may be used, for example, for the prevention and treatment of diseases such as breast cancer. Diagnostic methods based on detecting a breast tumor protein, or mRNA encoding such a protein, in a sample are also provided.</p>													

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COMPOSITIONS FOR THE TREATMENT AND DIAGNOSIS OF BREAST CANCER AND METHODS FOR THEIR USE

TECHNICAL FIELD

The present invention relates generally to compositions and methods for the treatment of breast cancer. The invention is more particularly related to polypeptides comprising at least a portion of a protein that is preferentially expressed in breast tumor tissue and to polynucleotides encoding such polypeptides. Such polypeptides and polynucleotides may be used in vaccines and pharmaceutical compositions for treatment of breast cancer.

BACKGROUND OF THE INVENTION

Breast cancer is a significant health problem for women in the United States and throughout the world. Although advances have been made in detection and treatment of the disease, breast cancer remains the second leading cause of cancer-related deaths in women, affecting more than 180,000 women in the United States each year. For women in North America, the life-time odds of getting breast cancer are one in eight.

No vaccine or other universally successful method for the prevention or treatment of breast cancer is currently available. Management of the disease currently relies on a combination of early diagnosis (through routine breast screening procedures) and aggressive treatment, which may include one or more of a variety of treatments such as surgery, radiotherapy, chemotherapy and hormone therapy. The course of treatment for a particular breast cancer is often selected based on a variety of prognostic parameters, including an analysis of specific tumor markers. *See, e.g., Porter-Jordan and Lippman, Breast Cancer 8:73-100 (1994).* However, the use of established markers often leads to a result that is difficult to interpret, and the high mortality observed in breast cancer patients indicates that improvements are needed in the treatment, diagnosis and prevention of the disease.

Accordingly, there is a need in the art for improved methods for the treatment and diagnosis of breast cancer. The present invention fulfills these needs and further provides other related advantages.

SUMMARY OF THE INVENTION

The present invention provides compounds and methods for the treatment and diagnosis of cancer, such as breast cancer. In one aspect, isolated polypeptides are provided comprising at least a portion of a breast tumor protein or a variant thereof. Certain portions and other variants are immunogenic, such that the ability of the variant to react with protein-specific antisera is not substantially diminished. With certain embodiments, the polypeptide comprises an amino acid sequence encoded by a polynucleotide selected from the group consisting of: (a) nucleotide sequences recited in SEQ ID NO: 1-61, 63-175, 178, 180, 182-313, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468; (b) complements of said nucleotide sequences; and (c) variants of a sequence of (a) or (b). In specific embodiments, the inventive polypeptides comprise at least a portion of a tumor antigen that comprises an amino acid sequence selected from the group consisting of SEQ ID NO: 62, 176, 179, 181 and 469-473.

In related aspects, isolated polynucleotides encoding the above polypeptides, or a portion thereof (such as a portion encoding at least 15 contiguous amino acid residues of a breast tumor protein), are provided. In specific embodiments, such polynucleotides comprise a sequence selected from the group consisting of sequences provided in SEQ ID NO: 1-61, 63-175, 178, 180, 182-313, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468 and variants thereof. The present invention further provides expression vectors comprising the above polynucleotides, together with host cells transformed or transfected with such expression vectors. In preferred embodiments, the host cells are selected from the group consisting of *E. coli*, yeast and mammalian cells.

In another aspect, the present invention provides fusion proteins comprising a first and a second inventive polypeptide or, alternatively, an inventive polypeptide and a known breast tumor antigen.

The present invention also provides pharmaceutical compositions comprising at least one of the above polypeptides, or a polynucleotide encoding such a polypeptide, and a physiologically acceptable carrier, together with vaccines. For prophylactic or therapeutic use, comprising at least one such polypeptide or polynucleotide in combination with an immunostimulant. Pharmaceutical compositions and vaccines comprising one or more of the above fusion proteins are also provided.

The present invention further provides pharmaceutical compositions that comprise: (a) an antibody or antigen-binding fragment thereof that specifically binds to a breast tumor protein; and (b) a physiologically acceptable carrier.

Within further aspects, the present invention provides pharmaceutical compositions comprising: (a) an antigen presenting cell that expresses a polypeptide as described above and (b) a pharmaceutically acceptable carrier or excipient. Antigen presenting cells include dendritic cells, macrophages, monocytes, fibroblasts and B cells.

Within related aspects, vaccines are provided that comprise: (a) an antigen presenting cell that expresses a polypeptide as described above and (b) an immunostimulant.

In yet another aspect, methods are provided for inhibiting the development of breast cancer in a patient, comprising administering an effective amount of at least one of the above pharmaceutical compositions and/or vaccines.

The present invention further provides, within other aspects, methods for removing tumor cells from a biological sample, comprising contacting a biological sample with T cells that specifically react with a breast tumor protein, wherein the step of contacting is performed under conditions and for a time sufficient to permit the removal of cells expressing the protein from the sample.

Within related aspects, methods are provided for inhibiting the development of a cancer in a patient, comprising administering to a patient a biological sample treated as described above.

Methods are further provided, within other aspects, for stimulating and/or expanding T cells specific for a breast tumor protein, comprising contacting T cells with one or more of: (i) a polypeptide as described above; (ii) a polynucleotide encoding such a polypeptide; and/or (iii) an antigen presenting cell that expresses such a polypeptide;

under conditions and for a time sufficient to permit the stimulation and/or expansion of T cells. Isolated T cell populations comprising T cells prepared as described above are also provided.

Within further aspects, the present invention provides methods for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a T cell population as described above.

The present invention further provides methods for inhibiting the development of a cancer in a patient, comprising the steps of: (a) incubating CD4⁺ and/or CD8⁺ T cells isolated from a patient with one or more of: (i) a polypeptide comprising at least an immunogenic portion of a breast tumor protein; (ii) a polynucleotide encoding such a polypeptide; and (iii) an antigen-presenting cell that expressed such a polypeptide; and (b) administering to the patient an effective amount of the proliferated T cells, and thereby inhibiting the development of a cancer in the patient. Proliferated cells may, but need not, be cloned prior to administration to the patient.

The polypeptides disclosed herein may be usefully employed in the diagnosis and monitoring of breast cancer. In one aspect of the present invention, methods are provided for detecting a cancer in a patient, comprising: (a) contacting a biological sample obtained from a patient with a binding agent that is capable of binding to one of the above polypeptides; and (b) detecting in the sample an amount of polypeptide that binds to the binding agent; and (c) comparing the amount of polypeptide with a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in a patient. In preferred embodiments, the binding agent is an antibody, most preferably a monoclonal antibody. The cancer may be breast cancer.

In related aspects, methods are provided for monitoring the progression of a cancer in a patient, comprising: (a) contacting a biological sample obtained from a patient with a binding agent that is capable of binding to one of the above polypeptides; (b) detecting in the sample an amount of a polypeptide that binds to the binding agent; (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and (d) comparing the amounts of polypeptide detected in steps (b) and (c).

Within related aspects, the present invention provides antibodies, preferably monoclonal antibodies, that bind to the inventive polypeptides, as well as diagnostic kits comprising such antibodies, and methods of using such antibodies to inhibit the development of breast cancer.

The present invention further provides, within other aspects, methods for determining the presence or absence of a cancer in a patient, comprising the steps of: (a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a breast tumor protein; (b) detecting in the sample a level of a polynucleotide, preferably mRNA, that hybridizes to the oligonucleotide; and (c) comparing the level of polynucleotide that hybridizes to the oligonucleotide with a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient. Within certain embodiments, the amount of mRNA is detected via polymerase chain reaction using, for example, at least one oligonucleotide primer that hybridizes to a polynucleotide encoding a polypeptide as recited above, or a complement of such a polynucleotide. Within other embodiments, the amount of mRNA is detected using a hybridization technique, employing an oligonucleotide probe that hybridizes to a polynucleotide that encodes a polypeptide as recited above, or a complement of such a polynucleotide.

In related aspects, diagnostic kits comprising the above oligonucleotide probes or primers are provided.

These and other aspects of the present invention will become apparent upon reference to the following detailed description. All references disclosed herein are hereby incorporated by reference in their entirety as if each was incorporated individually.

BRIEF DESCRIPTION OF THE DRAWING AND SEQUENCE IDENTIFIERS

Fig. 1 shows the results of a Northern blot of the clone SYN18C6 (SEQ ID NO: 40).

SEQ ID NO: 1 is the determined cDNA sequence of JBT2.

SEQ ID NO: 2 is the determined cDNA sequence of JBT6.

SEQ ID NO: 3 is the determined cDNA sequence of JBT7.

SEQ ID NO: 4 is the determined cDNA sequence of JBT10.
SEQ ID NO: 5 is the determined cDNA sequence of JBT13.
SEQ ID NO: 6 is the determined cDNA sequence of JBT14.
SEQ ID NO: 7 is the determined cDNA sequence of JBT15.
SEQ ID NO: 8 is the determined cDNA sequence of JBT16.
SEQ ID NO: 9 is the determined cDNA sequence of JBT17.
SEQ ID NO: 10 is the determined cDNA sequence of JBT22.
SEQ ID NO: 11 is the determined cDNA sequence of JBT25.
SEQ ID NO: 12 is the determined cDNA sequence of JBT28.
SEQ ID NO: 13 is the determined cDNA sequence of JBT32.
SEQ ID NO: 14 is the determined cDNA sequence of JBT33.
SEQ ID NO: 15 is the determined cDNA sequence of JBT34.
SEQ ID NO: 16 is the determined cDNA sequence of JBT36.
SEQ ID NO: 17 is the determined cDNA sequence of JBT37.
SEQ ID NO: 18 is the determined cDNA sequence of JBT51.
SEQ ID NO: 19 is the determined cDNA sequence of JBTT1.
SEQ ID NO: 20 is the determined cDNA sequence of JBTT7.
SEQ ID NO: 21 is the determined cDNA sequence of JBTT11.
SEQ ID NO: 22 is the determined cDNA sequence of JBTT14.
SEQ ID NO: 23 is the determined cDNA sequence of JBTT18.
SEQ ID NO: 24 is the determined cDNA sequence of JBTT19.
SEQ ID NO: 25 is the determined cDNA sequence of JBTT20.
SEQ ID NO: 26 is the determined cDNA sequence of JBTT21.
SEQ ID NO: 27 is the determined cDNA sequence of JBTT22.
SEQ ID NO: 28 is the determined cDNA sequence of JBTT28.
SEQ ID NO: 29 is the determined cDNA sequence of JBTT29.
SEQ ID NO: 30 is the determined cDNA sequence of JBTT33.
SEQ ID NO: 31 is the determined cDNA sequence of JBTT37.
SEQ ID NO: 32 is the determined cDNA sequence of JBTT38.
SEQ ID NO: 33 is the determined cDNA sequence of JBTT47.
SEQ ID NO: 34 is the determined cDNA sequence of JBTT48.

SEQ ID NO: 35 is the determined cDNA sequence of JBTT50.
SEQ ID NO: 36 is the determined cDNA sequence of JBTT51.
SEQ ID NO: 37 is the determined cDNA sequence of JBTT52.
SEQ ID NO: 38 is the determined cDNA sequence of JBTT54.
SEQ ID NO: 39 is the determined cDNA sequence of SYN17F4.
SEQ ID NO: 40 is the determined cDNA sequence of SYN18C6.
SEQ ID NO: 41 is the determined cDNA sequence of SYN19A2.
SEQ ID NO: 42 is the determined cDNA sequence of SYN19C8.
SEQ ID NO: 43 is the determined cDNA sequence of SYN20A12.
SEQ ID NO: 44 is the determined cDNA sequence of SYN20G6.
SEQ ID NO: 45 is the determined cDNA sequence of SYN20G6-2.
SEQ ID NO: 46 is the determined cDNA sequence of SYN21B9.
SEQ ID NO: 47 is the determined cDNA sequence of SYN21B9-2.
SEQ ID NO: 48 is the determined cDNA sequence of SYN21C10.
SEQ ID NO: 49 is the determined cDNA sequence of SYN21G10.
SEQ ID NO: 50 is the determined cDNA sequence of SYN21G10-2.
SEQ ID NO: 51 is the determined cDNA sequence of SYN21G11.
SEQ ID NO: 52 is the determined cDNA sequence of SYN21G11-2.
SEQ ID NO: 53 is the determined cDNA sequence of SYN21H8.
SEQ ID NO: 54 is the determined cDNA sequence of SYN22A10.
SEQ ID NO: 55 is the determined cDNA sequence of SYN22A10-2.
SEQ ID NO: 56 is the determined cDNA sequence of SYN22A12.
SEQ ID NO: 57 is the determined cDNA sequence of SYN22A2.
SEQ ID NO: 58 is the determined cDNA sequence of SYN22B4.
SEQ ID NO: 59 is the determined cDNA sequence of SYN22C2.
SEQ ID NO: 60 is the determined cDNA sequence of SYN22E10.
SEQ ID NO: 61 is the determined cDNA sequence of SYN22F2.
SEQ ID NO: 62 is a predicted amino acid sequence for SYN18C6.
SEQ ID NO: 63 is the determined cDNA sequence of B723P.
SEQ ID NO: 64 is the determined cDNA sequence for B724P.
SEQ ID NO: 65 is the determined cDNA sequence of B770P.

SEQ ID NO: 66 is the determined cDNA sequence of B716P.

SEQ ID NO: 67 is the determined cDNA sequence of B725P.

SEQ ID NO: 68 is the determined cDNA sequence of B717P.

SEQ ID NO: 69 is the determined cDNA sequence of B771P.

SEQ ID NO: 70 is the determined cDNA sequence of B722P.

SEQ ID NO: 71 is the determined cDNA sequence of B726P.

SEQ ID NO: 72 is the determined cDNA sequence of B727P.

SEQ ID NO: 73 is the determined cDNA sequence of B728P.

SEQ ID NO: 74-87 are the determined cDNA sequences of isolated clones which show homology to known sequences.

SEQ ID NO: 88 is the determined cDNA sequence of 13053.

SEQ ID NO: 89 is the determined cDNA sequence of 13057.

SEQ ID NO: 90 is the determined cDNA sequence of 13059.

SEQ ID NO: 91 is the determined cDNA sequence of 13065.

SEQ ID NO: 92 is the determined cDNA sequence of 13067.

SEQ ID NO: 93 is the determined cDNA sequence of 13068.

SEQ ID NO: 94 is the determined cDNA sequence of 13071.

SEQ ID NO: 95 is the determined cDNA sequence of 13072.

SEQ ID NO: 96 is the determined cDNA sequence of 13073.

SEQ ID NO: 97 is the determined cDNA sequence of 13075.

SEQ ID NO: 98 is the determined cDNA sequence of 13078.

SEQ ID NO: 99 is the determined cDNA sequence of 13079.

SEQ ID NO: 100 is the determined cDNA sequence of 13081.

SEQ ID NO: 101 is the determined cDNA sequence of 13082.

SEQ ID NO: 102 is the determined cDNA sequence of 13092.

SEQ ID NO: 103 is the determined cDNA sequence of 13097.

SEQ ID NO: 104 is the determined cDNA sequence of 13101.

SEQ ID NO: 105 is the determined cDNA sequence of 13102.

SEQ ID NO: 106 is the determined cDNA sequence of 13119.

SEQ ID NO: 107 is the determined cDNA sequence of 13131.

SEQ ID NO: 108 is the determined cDNA sequence of 13133.

SEQ ID NO: 109 is the determined cDNA sequence of 13135.
SEQ ID NO: 110 is the determined cDNA sequence of 13139.
SEQ ID NO: 111 is the determined cDNA sequence of 13140.
SEQ ID NO: 112 is the determined cDNA sequence of 13146.
SEQ ID NO: 113 is the determined cDNA sequence of 13147.
SEQ ID NO: 114 is the determined cDNA sequence of 13148.
SEQ ID NO: 115 is the determined cDNA sequence of 13149.
SEQ ID NO: 116 is the determined cDNA sequence of 13151.
SEQ ID NO: 117 is the determined cDNA sequence of 13051
SEQ ID NO: 118 is the determined cDNA sequence of 13052
SEQ ID NO: 119 is the determined cDNA sequence of 13055
SEQ ID NO: 120 is the determined cDNA sequence of 13058
SEQ ID NO: 121 is the determined cDNA sequence of 13062
SEQ ID NO: 122 is the determined cDNA sequence of 13064
SEQ ID NO: 123 is the determined cDNA sequence of 13080
SEQ ID NO: 124 is the determined cDNA sequence of 13093
SEQ ID NO: 125 is the determined cDNA sequence of 13094
SEQ ID NO: 126 is the determined cDNA sequence of 13095
SEQ ID NO: 127 is the determined cDNA sequence of 13096
SEQ ID NO: 128 is the determined cDNA sequence of 13099
SEQ ID NO: 129 is the determined cDNA sequence of 13100
SEQ ID NO: 130 is the determined cDNA sequence of 13103
SEQ ID NO: 131 is the determined cDNA sequence of 13106
SEQ ID NO: 132 is the determined cDNA sequence of 13107
SEQ ID NO: 133 is the determined cDNA sequence of 13108
SEQ ID NO: 134 is the determined cDNA sequence of 13121
SEQ ID NO: 135 is the determined cDNA sequence of 13126
SEQ ID NO: 136 is the determined cDNA sequence of 13129
SEQ ID NO: 137 is the determined cDNA sequence of 13130
SEQ ID NO: 138 is the determined cDNA sequence of 13134
SEQ ID NO: 139 is the determined cDNA sequence of 13141

SEQ ID NO: 140 is the determined cDNA sequence of 13142
SEQ ID NO: 141 is the determined cDNA sequence of 14376
SEQ ID NO: 142 is the determined cDNA sequence of 14377
SEQ ID NO: 143 is the determined cDNA sequence of 14383
SEQ ID NO: 144 is the determined cDNA sequence of 14384
SEQ ID NO: 145 is the determined cDNA sequence of 14387
SEQ ID NO: 146 is the determined cDNA sequence of 14392
SEQ ID NO: 147 is the determined cDNA sequence of 14394
SEQ ID NO: 148 is the determined cDNA sequence of 14398
SEQ ID NO: 149 is the determined cDNA sequence of 14401
SEQ ID NO: 150 is the determined cDNA sequence of 14402
SEQ ID NO: 151 is the determined cDNA sequence of 14405
SEQ ID NO: 152 is the determined cDNA sequence of 14409
SEQ ID NO: 153 is the determined cDNA sequence of 14412
SEQ ID NO: 154 is the determined cDNA sequence of 14414
SEQ ID NO: 155 is the determined cDNA sequence of 14415
SEQ ID NO: 156 is the determined cDNA sequence of 14416
SEQ ID NO: 157 is the determined cDNA sequence of 14419
SEQ ID NO: 158 is the determined cDNA sequence of 14426
SEQ ID NO: 159 is the determined cDNA sequence of 14427
SEQ ID NO: 160 is the determined cDNA sequence of 14375
SEQ ID NO: 161 is the determined cDNA sequence of 14378
SEQ ID NO: 162 is the determined cDNA sequence of 14379
SEQ ID NO: 163 is the determined cDNA sequence of 14380
SEQ ID NO: 164 is the determined cDNA sequence of 14381
SEQ ID NO: 165 is the determined cDNA sequence of 14382
SEQ ID NO: 166 is the determined cDNA sequence of 14388
SEQ ID NO: 167 is the determined cDNA sequence of 14399
SEQ ID NO: 168 is the determined cDNA sequence of 14406
SEQ ID NO: 169 is the determined cDNA sequence of 14407
SEQ ID NO: 170 is the determined cDNA sequence of 14408

SEQ ID NO: 171 is the determined cDNA sequence of 14417

SEQ ID NO: 172 is the determined cDNA sequence of 14418

SEQ ID NO: 173 is the determined cDNA sequence of 14423

SEQ ID NO: 174 is the determined cDNA sequence of 14424

SEQ ID NO: 175 is the determined cDNA sequence of B726P-20

SEQ ID NO: 176 is the predicted amino acid sequence of B726P-20

SEQ ID NO: 177 is a PCR primer

SEQ ID NO: 178 is the determined cDNA sequence of B726P-74

SEQ ID NO: 179 is the predicted amino acid sequence of B726P-74

SEQ ID NO: 180 is the determined cDNA sequence of B726P-79

SEQ ID NO: 181 is the predicted amino acid sequence of B726P-79

SEQ ID NO: 182 is the determined cDNA sequence of 19439.1, showing homology to the mammaglobin gene

SEQ ID NO: 183 is the determined cDNA sequence of 19407.1, showing homology to the human keratin gene

SEQ ID NO: 184 is the determined cDNA sequence of 19428.1, showing homology to human chromosome 17 clone

SEQ ID NO: 185 is the determined cDNA sequence of B808P (19408), showing no significant homology to any known gene

SEQ ID NO: 186 is the determined cDNA sequence of 19460.1, showing no significant homology to any known gene

SEQ ID NO: 187 is the determined cDNA sequence of 19419.1, showing homology to Ig kappa light chain

SEQ ID NO: 188 is the determined cDNA sequence of 19411.1, showing homology to human alpha-1 collagen

SEQ ID NO: 189 is the determined cDNA sequence of 19420.1, showing homology to mus musculus proteinase-3

SEQ ID NO: 190 is the determined cDNA sequence of 19432.1, showing homology to human high motility group box

SEQ ID NO: 191 is the determined cDNA sequence of 19412.1, showing homology to the human plasminogen activator gene

SEQ ID NO: 192 is the determined cDNA sequence of 19415.1, showing homology to mitogen activated protein kinase

SEQ ID NO: 193 is the determined cDNA sequence of 19409.1, showing homology to the chondroitin sulfate proteoglycan protein

SEQ ID NO: 194 is the determined cDNA sequence of 19406.1, showing no significant homology to any known gene

SEQ ID NO: 195 is the determined cDNA sequence of 19421.1, showing homology to human fibronectin

SEQ ID NO: 196 is the determined cDNA sequence of 19426.1, showing homology to the retinoic acid receptor responder 3

SEQ ID NO: 197 is the determined cDNA sequence of 19425.1, showing homology to MyD88 mRNA

SEQ ID NO: 198 is the determined cDNA sequence of 19424.1, showing homology to peptide transporter (TAP-1) mRNA

SEQ ID NO: 199 is the determined cDNA sequence of 19429.1, showing no significant homology to any known gene

SEQ ID NO: 200 is the determined cDNA sequence of 19435.1, showing homology to human polymorphic epithelial mucin

SEQ ID NO: 201 is the determined cDNA sequence of B813P (19434.1), showing homology to human GATA-3 transcription factor

SEQ ID NO: 202 is the determined cDNA sequence of 19461.1, showing homology to the human AP-2 gene

SEQ ID NO: 203 is the determined cDNA sequence of 19450.1, showing homology to DNA binding regulatory factor

SEQ ID NO: 204 is the determined cDNA sequence of 19451.1, showing homology to Na/H exchange regulatory co-factor

SEQ ID NO: 205 is the determined cDNA sequence of 19462.1, showing no significant homology to any known gene

SEQ ID NO: 206 is the determined cDNA sequence of 19455.1, showing homology to human mRNA for histone HAS.Z

SEQ ID NO: 207 is the determined cDNA sequence of 19459.1, showing

homology to PAC clone 179N16

SEQ ID NO: 208 is the determined cDNA sequence of 19464.1, showing no significant homology to any known gene

SEQ ID NO: 209 is the determined cDNA sequence of 19414.1, showing homology to lipophilin B

SEQ ID NO: 210 is the determined cDNA sequence of 19413.1, showing homology to chromosome 17 clone hRPK.209_J_20

SEQ ID NO: 211 is the determined cDNA sequence of 19416.1, showing no significant homology to any known gene

SEQ ID NO: 212 is the determined cDNA sequence of 19437.1, showing homology to human clone 24976 mRNA

SEQ ID NO: 213 is the determined cDNA sequence of 19449.1, showing homology to mouse DNA for PG-M core protein

SEQ ID NO: 214 is the determined cDNA sequence of 19446.1, showing no significant homology to any known gene

SEQ ID NO: 215 is the determined cDNA sequence of 19452.1, showing no significant homology to any known gene

SEQ ID NO: 216 is the determined cDNA sequence of 19483.1, showing no significant homology to any known gene

SEQ ID NO: 217 is the determined cDNA sequence of 19526.1, showing homology to human lipophilin C

SEQ ID NO: 218 is the determined cDNA sequence of 19484.1, showing homology to the secreted cement gland protein XAG-2

SEQ ID NO: 219 is the determined cDNA sequence of 19470.1, showing no significant homology to any known gene

SEQ ID NO: 220 is the determined cDNA sequence of 19469.1, showing homology to the human HLA-DM gene

SEQ ID NO: 221 is the determined cDNA sequence of 19482.1, showing homology to the human pS2 protein gene

SEQ ID NO: 222 is the determined cDNA sequence of B805P (19468.1), showing no significant homology to any known gene

SEQ ID NO: 223 is the determined cDNA sequence of 19467.1, showing homology to human thrombospondin mRNA

SEQ ID NO: 224 is the determined cDNA sequence of 19498.1, showing homology to the CDC2 gene involved in cell cycle control

SEQ ID NO: 225 is the determined cDNA sequence of 19506.1, showing homology to human cDNA for TREB protein

SEQ ID NO: 226 is the determined cDNA sequence of B806P (19505.1), showing no significant homology to any known gene

SEQ ID NO: 227 is the determined cDNA sequence of 19486.1, showing homology to type I epidermal keratin

SEQ ID NO: 228 is the determined cDNA sequence of 19510.1, showing homology to glucose transporter for glycoprotein

SEQ ID NO: 229 is the determined cDNA sequence of 19512.1, showing homology to the human lysyl hydroxylase gene

SEQ ID NO: 230 is the determined cDNA sequence of 19511.1, showing homology to human palmitoyl-protein thioesterase

SEQ ID NO: 231 is the determined cDNA sequence of 19508.1, showing homology to human alpha enolase

SEQ ID NO: 232 is the determined cDNA sequence of B807P (19509.1), showing no significant homology to any known gene

SEQ ID NO: 233 is the determined cDNA sequence of B809P (19520.1), showing homology to clone 102D24 on chromosome 11q13.31

SEQ ID NO: 234 is the determined cDNA sequence of 19507.1, showing homology to prosome beta-subunit

SEQ ID NO: 235 is the determined cDNA sequence of 19525.1, showing homology to human pro-urokinase precursor

SEQ ID NO: 236 is the determined cDNA sequence of 19513.1, showing no significant homology to any known gene

SEQ ID NO: 237 is the determined cDNA sequence of 19517.1, showing homology to human PAC 128M19 clone

SEQ ID NO: 238 is the determined cDNA sequence of 19564.1, showing

homology to human cytochrome P450-IIB

SEQ ID NO: 239 is the determined cDNA sequence of 19553.1, showing homology to human GABA-A receptor pi subunit

SEQ ID NO: 240 is the determined cDNA sequence of B811P (19575.1), showing no significant homology to any known gene

SEQ ID NO: 241 is the determined cDNA sequence of B810P (19560.1), showing no significant homology to any known gene

SEQ ID NO: 242 is the determined cDNA sequence of 19588.1, showing homology to aortic carboxypeptidase-like protein

SEQ ID NO: 243 is the determined cDNA sequence of 19551.1, showing homology to human BCL-1 gene

SEQ ID NO: 244 is the determined cDNA sequence of 19567.1, showing homology to human proteasome-related mRNA

SEQ ID NO: 245 is the determined cDNA sequence of B803P (19583.1), showing no significant homology to any known gene

SEQ ID NO: 246 is the determined cDNA sequence of B812P (19587.1), showing no significant homology to any known gene

SEQ ID NO: 247 is the determined cDNA sequence of B802P (19392.2), showing homology to human chromosome 17

SEQ ID NO: 248 is the determined cDNA sequence of 19393.2, showing homology to human nicein B2 chain

SEQ ID NO: 249 is the determined cDNA sequence of 19398.2, human MHC class II DQ alpha mRNA

SEQ ID NO: 250 is the determined cDNA sequence of B804P (19399.2), showing homology to human Xp22 BAC GSHB-184P14

SEQ ID NO: 251 is the determined cDNA sequence of 19401.2, showing homology to human ikB kinase-b gene

SEQ ID NO: 252 is the determined cDNA sequence of 20266, showing no significant homology to any known gene

SEQ ID NO: 253 is the determined cDNA sequence of B826P (20270), showing no significant homology to any known gene

SEQ ID NO: 254 is the determined cDNA sequence of 20274, showing no significant homology to any known gene

SEQ ID NO: 255 is the determined cDNA sequence of 20276, showing no significant homology to any known gene

SEQ ID NO: 256 is the determined cDNA sequence of 20277, showing no significant homology to any known gene

SEQ ID NO: 257 is the determined cDNA sequence of B823P (20280), showing no significant homology to any known gene

SEQ ID NO: 258 is the determined cDNA sequence of B821P (20281), showing no significant homology to any known gene

SEQ ID NO: 259 is the determined cDNA sequence of B824P (20294), showing no significant homology to any known gene

SEQ ID NO: 260 is the determined cDNA sequence of 20303, showing no significant homology to any known gene

SEQ ID NO: 261 is the determined cDNA sequence of B820P (20310), showing no significant homology to any known gene

SEQ ID NO: 262 is the determined cDNA sequence of B825P (20336), showing no significant homology to any known gene

SEQ ID NO: 263 is the determined cDNA sequence of B827P (20341), showing no significant homology to any known gene

SEQ ID NO: 264 is the determined cDNA sequence of 20941, showing no significant homology to any known gene

SEQ ID NO: 265 is the determined cDNA sequence of 20954, showing no significant homology to any known gene

SEQ ID NO: 266 is the determined cDNA sequence of 20961, showing no significant homology to any known gene

SEQ ID NO: 267 is the determined cDNA sequence of 20965, showing no significant homology to any known gene

SEQ ID NO: 268 is the determined cDNA sequence of 20975, showing no significant homology to any known gene

SEQ ID NO: 269 is the determined cDNA sequence of 20261, showing

homology to Human p120 catenin

SEQ ID NO: 270 is the determined cDNA sequence of B822P (20262), showing homology to Human membrane glycoprotein 4F2

SEQ ID NO: 271 is the determined cDNA sequence of 20265, showing homology to Human Na, K-ATPase Alpha 1

SEQ ID NO: 272 is the determined cDNA sequence of 20267, showing homology to Human heart HS 90, partial cds

SEQ ID NO: 273 is the determined cDNA sequence of 20268, showing homology to Human mRNA GPI-anchored protein p137

SEQ ID NO: 274 is the determined cDNA sequence of 20271, showing homology to Human cleavage stimulation factor 77 kDa subunit

SEQ ID NO: 275 is the determined cDNA sequence of 20272, showing homology to Human p190-B

SEQ ID NO: 276 is the determined cDNA sequence of 20273, showing homology to Human ribophorin

SEQ ID NO: 277 is the determined cDNA sequence of 20278, showing homology to Human ornithine amino transferase

SEQ ID NO: 278 is the determined cDNA sequence of 20279, showing homology to Human S-adenosylmethionine synthetase

SEQ ID NO: 279 is the determined cDNA sequence of 20293, showing homology to Human x inactivation transcript

SEQ ID NO: 280 is the determined cDNA sequence of 20300, showing homology to Human cytochrome p450

SEQ ID NO: 281 is the determined cDNA sequence of 20305, showing homology to Human elongation factor-1 alpha

SEQ ID NO: 282 is the determined cDNA sequence of 20306, showing homology to Human epithelial ets protein

SEQ ID NO: 283 is the determined cDNA sequence of 20307, showing homology to Human signal transducer mRNA

SEQ ID NO: 284 is the determined cDNA sequence of 20313, showing homology to Human GABA-A receptor pi subunit mRNA

SEQ ID NO: 285 is the determined cDNA sequence of 20317, showing homology to Human tyrosine phosphatase

SEQ ID NO: 286 is the determined cDNA sequence of 20318, showing homology to Human cathepsin B proteinase

SEQ ID NO: 287 is the determined cDNA sequence of 20320, showing homology to Human 2-phosphopyruvate-hydratase-alpha-enolase

SEQ ID NO: 288 is the determined cDNA sequence of 20321, showing homology to Human E-cadherin

SEQ ID NO: 289 is the determined cDNA sequence of 20322, showing homology to Human hsp86

SEQ ID NO: 290 is the determined cDNA sequence of B828P (20326), showing homology to Human x inactivation transcript

SEQ ID NO: 291 is the determined cDNA sequence of 20333, showing homology to Human chromatin regulator, SMARCA5

SEQ ID NO: 292 is the determined cDNA sequence of 20335, showing homology to Human sphingolipid activator protein 1

SEQ ID NO: 293 is the determined cDNA sequence of 20337, showing homology to Human hepatocyte growth factor activator inhibitor type 2

SEQ ID NO: 294 is the determined cDNA sequence of 20338, showing homology to Human cell adhesion molecule CD44

SEQ ID NO: 295 is the determined cDNA sequence of 20340, showing homology to Human nuclear factor (erythroid-derived)-like 1

SEQ ID NO: 296 is the determined cDNA sequence of 20938, showing homology to Human vinculin mRNA

SEQ ID NO: 297 is the determined cDNA sequence of 20939, showing homology to Human elongation factor EF-1-alpha

SEQ ID NO: 298 is the determined cDNA sequence of 20940, showing homology to Human nestin gene

SEQ ID NO: 299 is the determined cDNA sequence of 20942, showing homology to Human pancreatic ribonuclease

SEQ ID NO: 300 is the determined cDNA sequence of 20943, showing

homology to Human transcobalamin I

SEQ ID NO: 301 is the determined cDNA sequence of 20944, showing homology to Human beta-tubulin

SEQ ID NO: 302 is the determined cDNA sequence of 20946, showing homology to Human HS1 protein

SEQ ID NO: 303 is the determined cDNA sequence of 20947, showing homology to Human cathepsin B

SEQ ID NO: 304 is the determined cDNA sequence of 20948, showing homology to Human testis enhanced gene transcript

SEQ ID NO: 305 is the determined cDNA sequence of 20949, showing homology to Human elongation factor EF-1-alpha

SEQ ID NO: 306 is the determined cDNA sequence of 20950, showing homology to Human ADP-ribosylation factor 3

SEQ ID NO: 307 is the determined cDNA sequence of 20951, showing homology to Human IFP53 or WRS for tryptophanyl-tRNA synthetase

SEQ ID NO: 308 is the determined cDNA sequence of 20952, showing homology to Human cyclin-dependent protein kinase

SEQ ID NO: 308 is the determined cDNA sequence of 20957, showing homology to Human alpha-tubulin sioform 1

SEQ ID NO: 309 is the determined cDNA sequence of 20959, showing homology to Human tyrosine phosphatase-61bp deletion

SEQ ID NO: 310 is the determined cDNA sequence of 20966, showing homology to Human tyrosine phosphatase

SEQ ID NO: 311 is the determined cDNA sequence of B830P (20976), showing homology to Human nuclear factor NF 45

SEQ ID NO: 312 is the determined cDNA sequence of B829P (20977), showing homology to Human delta-6 fatty acid desaturase

SEQ ID NO: 313 is the determined cDNA sequence of 20978, showing homology to Human nuclear aconitase

SEQ ID NO: 314 is the determined cDNA sequence of 19465, showing no significant homology to any known gene.

SEQ ID NO: 315 is the determined cDNA sequence of clone 23176.
SEQ ID NO: 316 is the determined cDNA sequence of clone 23140.
SEQ ID NO: 317 is the determined cDNA sequence of clone 23166.
SEQ ID NO: 318 is the determined cDNA sequence of clone 23167.
SEQ ID NO: 319 is the determined cDNA sequence of clone 23177.
SEQ ID NO: 320 is the determined cDNA sequence of clone 23217.
SEQ ID NO: 321 is the determined cDNA sequence of clone 23169.
SEQ ID NO: 322 is the determined cDNA sequence of clone 23160.
SEQ ID NO: 323 is the determined cDNA sequence of clone 23182.
SEQ ID NO: 324 is the determined cDNA sequence of clone 23232.
SEQ ID NO: 325 is the determined cDNA sequence of clone 23203.
SEQ ID NO: 326 is the determined cDNA sequence of clone 23198.
SEQ ID NO: 327 is the determined cDNA sequence of clone 23224.
SEQ ID NO: 328 is the determined cDNA sequence of clone 23142.
SEQ ID NO: 329 is the determined cDNA sequence of clone 23138.
SEQ ID NO: 330 is the determined cDNA sequence of clone 23147.
SEQ ID NO: 331 is the determined cDNA sequence of clone 23148.
SEQ ID NO: 332 is the determined cDNA sequence of clone 23149.
SEQ ID NO: 333 is the determined cDNA sequence of clone 23172.
SEQ ID NO: 334 is the determined cDNA sequence of clone 23158.
SEQ ID NO: 335 is the determined cDNA sequence of clone 23156.
SEQ ID NO: 336 is the determined cDNA sequence of clone 23221.
SEQ ID NO: 337 is the determined cDNA sequence of clone 23223.
SEQ ID NO: 338 is the determined cDNA sequence of clone 23155.
SEQ ID NO: 339 is the determined cDNA sequence of clone 23225.
SEQ ID NO: 340 is the determined cDNA sequence of clone 23226.
SEQ ID NO: 341 is the determined cDNA sequence of clone 23228.
SEQ ID NO: 342 is the determined cDNA sequence of clone 23229.
SEQ ID NO: 343 is the determined cDNA sequence of clone 23231.
SEQ ID NO: 344 is the determined cDNA sequence of clone 23154.
SEQ ID NO: 345 is the determined cDNA sequence of clone 23157.

SEQ ID NO: 346 is the determined cDNA sequence of clone 23153.
SEQ ID NO: 347 is the determined cDNA sequence of clone 23159.
SEQ ID NO: 348 is the determined cDNA sequence of clone 23152.
SEQ ID NO: 349 is the determined cDNA sequence of clone 23161.
SEQ ID NO: 350 is the determined cDNA sequence of clone 23162.
SEQ ID NO: 351 is the determined cDNA sequence of clone 23163.
SEQ ID NO: 352 is the determined cDNA sequence of clone 23164.
SEQ ID NO: 353 is the determined cDNA sequence of clone 23165.
SEQ ID NO: 354 is the determined cDNA sequence of clone 23151.
SEQ ID NO: 355 is the determined cDNA sequence of clone 23150.
SEQ ID NO: 356 is the determined cDNA sequence of clone 23168.
SEQ ID NO: 357 is the determined cDNA sequence of clone 23146.
SEQ ID NO: 358 is the determined cDNA sequence of clone 23170.
SEQ ID NO: 359 is the determined cDNA sequence of clone 23171.
SEQ ID NO: 360 is the determined cDNA sequence of clone 23145.
SEQ ID NO: 361 is the determined cDNA sequence of clone 23174.
SEQ ID NO: 362 is the determined cDNA sequence of clone 23175.
SEQ ID NO: 363 is the determined cDNA sequence of clone 23144.
SEQ ID NO: 364 is the determined cDNA sequence of clone 23178.
SEQ ID NO: 365 is the determined cDNA sequence of clone 23179.
SEQ ID NO: 366 is the determined cDNA sequence of clone 23180.
SEQ ID NO: 367 is the determined cDNA sequence of clone 23181.
SEQ ID NO: 368 is the determined cDNA sequence of clone 23143.
SEQ ID NO: 369 is the determined cDNA sequence of clone 23183.
SEQ ID NO: 370 is the determined cDNA sequence of clone 23184.
SEQ ID NO: 371 is the determined cDNA sequence of clone 23185.
SEQ ID NO: 372 is the determined cDNA sequence of clone 23186.
SEQ ID NO: 373 is the determined cDNA sequence of clone 23187.
SEQ ID NO: 374 is the determined cDNA sequence of clone 23190.
SEQ ID NO: 375 is the determined cDNA sequence of clone 23189.
SEQ ID NO: 376 is the determined cDNA sequence of clone 23202.

SEQ ID NO: 378 is the determined cDNA sequence of clone 23191.
SEQ ID NO: 379 is the determined cDNA sequence of clone 23188.
SEQ ID NO: 380 is the determined cDNA sequence of clone 23194.
SEQ ID NO: 381 is the determined cDNA sequence of clone 23196.
SEQ ID NO: 382 is the determined cDNA sequence of clone 23195.
SEQ ID NO: 383 is the determined cDNA sequence of clone 23193.
SEQ ID NO: 384 is the determined cDNA sequence of clone 23199.
SEQ ID NO: 385 is the determined cDNA sequence of clone 23200.
SEQ ID NO: 386 is the determined cDNA sequence of clone 23192.
SEQ ID NO: 387 is the determined cDNA sequence of clone 23201.
SEQ ID NO: 388 is the determined cDNA sequence of clone 23141.
SEQ ID NO: 389 is the determined cDNA sequence of clone 23139.
SEQ ID NO: 390 is the determined cDNA sequence of clone 23204.
SEQ ID NO: 391 is the determined cDNA sequence of clone 23205.
SEQ ID NO: 392 is the determined cDNA sequence of clone 23206.
SEQ ID NO: 393 is the determined cDNA sequence of clone 23207.
SEQ ID NO: 394 is the determined cDNA sequence of clone 23208.
SEQ ID NO: 395 is the determined cDNA sequence of clone 23209.
SEQ ID NO: 396 is the determined cDNA sequence of clone 23210.
SEQ ID NO: 397 is the determined cDNA sequence of clone 23211.
SEQ ID NO: 398 is the determined cDNA sequence of clone 23212.
SEQ ID NO: 399 is the determined cDNA sequence of clone 23214.
SEQ ID NO: 400 is the determined cDNA sequence of clone 23215.
SEQ ID NO: 401 is the determined cDNA sequence of clone 23216.
SEQ ID NO: 402 is the determined cDNA sequence of clone 23137.
SEQ ID NO: 403 is the determined cDNA sequence of clone 23218.
SEQ ID NO: 404 is the determined cDNA sequence of clone 23220.
SEQ ID NO: 405 is the determined cDNA sequence of clone 19462.
SEQ ID NO: 406 is the determined cDNA sequence of clone 19430.
SEQ ID NO: 407 is the determined cDNA sequence of clone 19407.
SEQ ID NO: 408 is the determined cDNA sequence of clone 19448.

SEQ ID NO: 409 is the determined cDNA sequence of clone 19447.
SEQ ID NO: 410 is the determined cDNA sequence of clone 19426.
SEQ ID NO: 411 is the determined cDNA sequence of clone 19441.
SEQ ID NO: 412 is the determined cDNA sequence of clone 19454.
SEQ ID NO: 413 is the determined cDNA sequence of clone 19463.
SEQ ID NO: 414 is the determined cDNA sequence of clone 19419.
SEQ ID NO: 415 is the determined cDNA sequence of clone 19434.
SEQ ID NO: 416 is the determined extended cDNA sequence of B820P.
SEQ ID NO: 417 is the determined extended cDNA sequence of B821P.
SEQ ID NO: 418 is the determined extended cDNA sequence of B822P.
SEQ ID NO: 419 is the determined extended cDNA sequence of B823P.
SEQ ID NO: 420 is the determined extended cDNA sequence of B824P.
SEQ ID NO: 421 is the determined extended cDNA sequence of B825P.
SEQ ID NO: 422 is the determined extended cDNA sequence of B826P.
SEQ ID NO: 423 is the determined extended cDNA sequence of B827P.
SEQ ID NO: 424 is the determined extended cDNA sequence of B828P.
SEQ ID NO: 425 is the determined extended cDNA sequence of B829P.
SEQ ID NO: 426 is the determined extended cDNA sequence of B830P.
SEQ ID NO: 427 is the determined cDNA sequence of clone 266B4.
SEQ ID NO: 428 is the determined cDNA sequence of clone 22892.
SEQ ID NO: 429 is the determined cDNA sequence of clone 266G3.
SEQ ID NO: 430 is the determined cDNA sequence of clone 22890.
SEQ ID NO: 431 is the determined cDNA sequence of clone 264B4.
SEQ ID NO: 432 is the determined cDNA sequence of clone 22883.
SEQ ID NO: 433 is the determined cDNA sequence of clone 22882.
SEQ ID NO: 434 is the determined cDNA sequence of clone 22880.
SEQ ID NO: 435 is the determined cDNA sequence of clone 263G1.
SEQ ID NO: 436 is the determined cDNA sequence of clone 263G6.
SEQ ID NO: 437 is the determined cDNA sequence of clone 262B2.
SEQ ID NO: 438 is the determined cDNA sequence of clone 262B6.
SEQ ID NO: 439 is the determined cDNA sequence of clone 22869.

SEQ ID NO: 440 is the determined cDNA sequence of clone 21374.
SEQ ID NO: 441 is the determined cDNA sequence of clone 21362.
SEQ ID NO: 442 is the determined cDNA sequence of clone 21349.
SEQ ID NO: 443 is the determined cDNA sequence of clone 21309.
SEQ ID NO: 444 is the determined cDNA sequence of clone 21097.
SEQ ID NO: 445 is the determined cDNA sequence of clone 21096.
SEQ ID NO: 446 is the determined cDNA sequence of clone 21094.
SEQ ID NO: 447 is the determined cDNA sequence of clone 21093.
SEQ ID NO: 448 is the determined cDNA sequence of clone 21091.
SEQ ID NO: 449 is the determined cDNA sequence of clone 21089.
SEQ ID NO: 450 is the determined cDNA sequence of clone 21087.
SEQ ID NO: 451 is the determined cDNA sequence of clone 21085.
SEQ ID NO: 452 is the determined cDNA sequence of clone 21084.
SEQ ID NO: 453 is a first partial cDNA sequence of clone 2BT1-40.
SEQ ID NO: 454 is a second partial cDNA sequence of clone 2BT1-40.
SEQ ID NO: 455 is the determined cDNA sequence of clone 21063.
SEQ ID NO: 456 is the determined cDNA sequence of clone 21062.
SEQ ID NO: 457 is the determined cDNA sequence of clone 21060.
SEQ ID NO: 458 is the determined cDNA sequence of clone 21053.
SEQ ID NO: 459 is the determined cDNA sequence of clone 21050.
SEQ ID NO: 460 is the determined cDNA sequence of clone 21036.
SEQ ID NO: 461 is the determined cDNA sequence of clone 21037.
SEQ ID NO: 462 is the determined cDNA sequence of clone 21048.
SEQ ID NO: 463 is a consensus DNA sequence of B726P (referred to as B726P-spliced_seq_B726P).
SEQ ID NO: 464 is the determined cDNA sequence of a second splice form of B726P (referred to as 27490.seq_B726P).
SEQ ID NO: 465 is the determined cDNA sequence of a third splice form of B726P (referred to as 27068.seq_B726P).
SEQ ID NO: 466 is the determined cDNA sequence of a second splice form of B726P (referred to as 23113.seq_B726P).

SEQ ID NO: 467 is the determined cDNA sequence of a second splice form of B726P (referred to as 23103.seq_B726P).

SEQ ID NO: 468 is the determined cDNA sequence of a second splice form of B726P (referred to as 19310.seq_B726P).

SEQ ID NO: 469 is the predicted amino acid sequence encoded by the upstream ORF of SEQ ID NO: 463.

SEQ ID NO: 470 is the predicted amino acid sequence encoded by SEQ ID NO: 464.

SEQ ID NO: 471 is the predicted amino acid sequence encoded by SEQ ID NO: 465.

SEQ ID NO: 472 is the predicted amino acid sequence encoded by SEQ ID NO: 466.

SEQ ID NO: 473 is the predicted amino acid sequence encoded by SEQ ID NO: 467.

DETAILED DESCRIPTION OF THE INVENTION

As noted above, the present invention is generally directed to compositions and methods for the therapy and diagnosis of cancer, such as breast cancer. The compositions described herein may include breast tumor polypeptides, polynucleotides encoding such polypeptides, binding agents such as antibodies, antigen presenting cells (APCs) and/or immune system cells (*e.g.*, T cells). Polypeptides of the present invention generally comprise at least a portion (such as an immunogenic portion) of a breast tumor protein or a variant thereof. A "breast tumor protein" is a protein that is expressed in breast tumor cells at a level that is at least two fold, and preferably at least five fold, greater than the level of expression in a normal tissue, as determined using a representative assay provided herein. Certain breast tumor proteins are tumor proteins that react detectably (within an immunoassay, such as an ELISA or Western blot) with antisera of a patient afflicted with breast cancer. Polynucleotides of the subject invention generally comprise a DNA or RNA sequence that encodes all or a portion of such a polypeptide, or that is complementary to such a sequence. Antibodies are generally immune system proteins, or antigen-binding fragments thereof, that are capable of

binding to a polypeptide as described above. Antigen presenting cells include dendritic cells, macrophages, monocytes, fibroblasts and B-cells that express a polypeptide as described above. T cells that may be employed within such compositions are generally T cells that are specific for a polypeptide as described above.

The present invention is based on the discovery of human breast tumor proteins. Sequences of polynucleotides encoding specific tumor proteins are provided in SEQ ID NOS:1-175, 178, 180 and 182-468.

BREAST TUMOR PROTEIN POLYNUCLEOTIDES

Any polynucleotide that encodes a breast tumor protein or a portion or other variant thereof as described herein is encompassed by the present invention. Preferred polynucleotides comprise at least 15 consecutive nucleotides, preferably at least 30 consecutive nucleotides and more preferably at least 45 consecutive nucleotides, that encode a portion of a breast tumor protein. More preferably, a polynucleotide encodes an immunogenic portion of a breast tumor protein. Polynucleotides complementary to any such sequences are also encompassed by the present invention. Polynucleotides may be single-stranded (coding or antisense) or double-stranded, and may be DNA (genomic, cDNA or synthetic) or RNA molecules. RNA molecules include HnRNA molecules, which contain introns and correspond to a DNA molecule in a one-to-one manner, and mRNA molecules, which do not contain introns. Additional coding or non-coding sequences may, but need not, be present within a polynucleotide of the present invention, and a polynucleotide may, but need not, be linked to other molecules and/or support materials.

Polynucleotides may comprise a native sequence (*i.e.*, an endogenous sequence that encodes a breast tumor protein or a portion thereof) or may comprise a variant of such a sequence. Polynucleotide variants may contain one or more substitutions, additions, deletions and/or insertions such that the immunogenicity of the encoded polypeptide is not diminished, relative to a native tumor protein. The effect on the immunogenicity of the encoded polypeptide may generally be assessed as described herein. Variants preferably exhibit at least about 70% identity, more preferably at least about 80% identity and most preferably at least about 90% identity to a polynucleotide

sequence that encodes a native breast tumor protein or a portion thereof. The term "variants" also encompasses homologous genes of xenogenic origin.

Two polynucleotide or polypeptide sequences are said to be "identical" if the sequence of nucleotides or amino acids in the two sequences is the same when aligned for maximum correspondence as described below. Comparisons between two sequences are typically performed by comparing the sequences over a comparison window to identify and compare local regions of sequence similarity. A "comparison window" as used herein, refers to a segment of at least about 20 contiguous positions, usually 30 to about 75, 40 to about 50, in which a sequence may be compared to a reference sequence of the same number of contiguous positions after the two sequences are optimally aligned.

Optimal alignment of sequences for comparison may be conducted using the Megalign program in the Lasergene suite of bioinformatics software (DNASTAR, Inc., Madison, WI), using default parameters. This program embodies several alignment schemes described in the following references: Dayhoff, M.O. (1978) A model of evolutionary change in proteins – Matrices for detecting distant relationships. In Dayhoff, M.O. (ed.) *Atlas of Protein Sequence and Structure*, National Biomedical Research Foundation, Washington DC Vol. 5, Suppl. 3, pp. 345-358; Hein J. (1990) Unified Approach to Alignment and Phylogenies pp. 626-645 *Methods in Enzymology* vol. 183, Academic Press, Inc., San Diego, CA; Higgins, D.G. and Sharp, P.M. (1989) *CABIOS* 5:151-153; Myers, E.W. and Muller W. (1988) *CABIOS* 4:11-17; Robinson, E.D. (1971) *Comb. Theor* 11:105; Santou, N. Nes, M. (1987) *Mol. Biol. Evol.* 4:406-425; Sneath, P.H.A. and Sokal, R.R. (1973) *Numerical Taxonomy – the Principles and Practice of Numerical Taxonomy*, Freeman Press, San Francisco, CA; Wilbur, W.J. and Lipman, D.J. (1983) *Proc. Natl. Acad., Sci. USA* 80:726-730.

Preferably, the "percentage of sequence identity" is determined by comparing two optimally aligned sequences over a window of comparison of at least 20 positions, wherein the portion of the polynucleotide or polypeptide sequence in the comparison window may comprise additions or deletions (i.e. gaps) of 20 percent or less, usually 5 to 15 percent, or 10 to 12 percent, as compared to the reference sequences (which does not comprise additions or deletions) for optimal alignment of the two

sequences. The percentage is calculated by determining the number of positions at which the identical nucleic acid bases or amino acid residue occurs in both sequences to yield the number of matched positions, dividing the number of matched positions by the total number of positions in the reference sequence (i.e. the window size) and multiplying the results by 100 to yield the percentage of sequence identity.

Variants may also, or alternatively, be substantially homologous to a native gene, or a portion or complement thereof. Such polynucleotide variants are capable of hybridizing under moderately stringent conditions to a naturally occurring DNA sequence encoding a native breast tumor protein (or a complementary sequence). Suitable moderately stringent conditions include prewashing in a solution of 5 X SSC, 0.5% SDS, 1.0 mM EDTA (pH 8.0); hybridizing at 50°C-65°C, 5 X SSC, overnight; followed by washing twice at 65°C for 20 minutes with each of 2X, 0.5X and 0.2X SSC containing 0.1% SDS.

It will be appreciated by those of ordinary skill in the art that, as a result of the degeneracy of the genetic code, there are many nucleotide sequences that encode a polypeptide as described herein. Some of these polynucleotides bear minimal homology to the nucleotide sequence of any native gene. Nonetheless, polynucleotides that vary due to differences in codon usage are specifically contemplated by the present invention. Further, alleles of the genes comprising the polynucleotide sequences provided herein are within the scope of the present invention. Alleles are endogenous genes that are altered as a result of one or more mutations, such as deletions, additions and/or substitutions of nucleotides. The resulting mRNA and protein may, but need not, have an altered structure or function. Alleles may be identified using standard techniques (such as hybridization, amplification and/or database sequence comparison).

Polynucleotides may be prepared using any of a variety of techniques. For example, a polynucleotide may be identified, as described in more detail below, by screening a microarray of cDNAs for tumor-associated expression (*i.e.*, expression that is at least five fold greater in a breast tumor than in normal tissue, as determined using a representative assay provided herein). Such screens may be performed using a Synteni microarray (Palo Alto, CA) according to the manufacturer's instructions (and essentially

as described by Schena et al., *Proc. Natl. Acad. Sci. USA* 93:10614-10619, 1996 and Heller et al., *Proc. Natl. Acad. Sci. USA* 94:2150-2155, 1997). Alternatively, polypeptides may be amplified from cDNA prepared from cells expressing the proteins described herein, such as breast tumor cells. Such polynucleotides may be amplified via polymerase chain reaction (PCR). For this approach, sequence-specific primers may be designed based on the sequences provided herein, and may be purchased or synthesized.

An amplified portion may be used to isolate a full length gene from a suitable library (*e.g.*, a breast tumor cDNA library) using well known techniques. Within such techniques, a library (cDNA or genomic) is screened using one or more polynucleotide probes or primers suitable for amplification. Preferably, a library is size-selected to include larger molecules. Random primed libraries may also be preferred for identifying 5' and upstream regions of genes. Genomic libraries are preferred for obtaining introns and extending 5' sequences.

For hybridization techniques, a partial sequence may be labeled (*e.g.*, by nick-translation or end-labeling with ^{32}P) using well known techniques. A bacterial or bacteriophage library is then screened by hybridizing filters containing denatured bacterial colonies (or lawns containing phage plaques) with the labeled probe (*see* Sambrook et al., *Molecular Cloning: A Laboratory Manual*, Cold Spring Harbor Laboratories, Cold Spring Harbor, NY, 1989). Hybridizing colonies or plaques are selected and expanded, and the DNA is isolated for further analysis. cDNA clones may be analyzed to determine the amount of additional sequence by, for example, PCR using a primer from the partial sequence and a primer from the vector. Restriction maps and partial sequences may be generated to identify one or more overlapping clones. The complete sequence may then be determined using standard techniques, which may involve generating a series of deletion clones. The resulting overlapping sequences are then assembled into a single contiguous sequence. A full length cDNA molecule can be generated by ligating suitable fragments, using well known techniques.

Alternatively, there are numerous amplification techniques for obtaining a full length coding sequence from a partial cDNA sequence. Within such techniques, amplification is generally performed via PCR. Any of a variety of commercially available kits may be used to perform the amplification step. Primers may be designed

using, for example, software well known in the art. Primers are preferably 22-30 nucleotides in length, have a GC content of at least 50% and anneal to the target sequence at temperatures of about 68°C to 72°C. The amplified region may be sequenced as described above, and overlapping sequences assembled into a contiguous sequence.

One such amplification technique is inverse PCR (*see* Triglia et al., *Nucl. Acids Res.* 16:8186, 1988), which uses restriction enzymes to generate a fragment in the known region of the gene. The fragment is then circularized by intramolecular ligation and used as a template for PCR with divergent primers derived from the known region. Within an alternative approach, sequences adjacent to a partial sequence may be retrieved by amplification with a primer to a linker sequence and a primer specific to a known region. The amplified sequences are typically subjected to a second round of amplification with the same linker primer and a second primer specific to the known region. A variation on this procedure, which employs two primers that initiate extension in opposite directions from the known sequence, is described in WO 96/38591. Another such technique is known as "rapid amplification of cDNA ends" or RACE. This technique involves the use of an internal primer and an external primer, which hybridizes to a polyA region or vector sequence, to identify sequences that are 5' and 3' of a known sequence. Additional techniques include capture PCR (Lagerstrom et al., *PCR Methods Applic.* 1:111-19, 1991) and walking PCR (Parker et al., *Nucl. Acids. Res.* 19:3055-60, 1991). Other methods employing amplification may also be employed to obtain a full length cDNA sequence.

In certain instances, it is possible to obtain a full length cDNA sequence by analysis of sequences provided in an expressed sequence tag (EST) database, such as that available from GenBank. Searches for overlapping ESTs may generally be performed using well known programs (*e.g.*, NCBI BLAST searches), and such ESTs may be used to generate a contiguous full length sequence. Full length DNA sequences may also be obtained by analysis of genomic fragments.

Certain nucleic acid sequences of cDNA molecules encoding portions of breast tumor proteins are provided in SEQ ID NO: 1-175, 178, 180 and 182-468. The

isolation of these sequences is described in detail below.

Polynucleotide variants may generally be prepared by any method known in the art, including chemical synthesis by, for example, solid phase phosphoramidite chemical synthesis. Modifications in a polynucleotide sequence may also be introduced using standard mutagenesis techniques, such as oligonucleotide-directed site-specific mutagenesis (*see* Adelman et al., *DNA* 2:183, 1983). Alternatively, RNA molecules may be generated by *in vitro* or *in vivo* transcription of DNA sequences encoding a breast tumor protein, or portion thereof, provided that the DNA is incorporated into a vector with a suitable RNA polymerase promoter (such as T7 or SP6). Certain portions may be used to prepare an encoded polypeptide, as described herein. In addition, or alternatively, a portion may be administered to a patient such that the encoded polypeptide is generated *in vivo* (*e.g.*, by transfecting antigen-presenting cells, such as dendritic cells, with a cDNA construct encoding a breast tumor polypeptide, and administering the transfected cells to the patient).

A portion of a sequence complementary to a coding sequence (*i.e.*, an antisense polynucleotide) may also be used as a probe or to modulate gene expression. cDNA constructs that can be transcribed into antisense RNA may also be introduced into cells of tissues to facilitate the production of antisense RNA. An antisense polynucleotide may be used, as described herein, to inhibit expression of a tumor protein. Antisense technology can be used to control gene expression through triple-helix formation, which compromises the ability of the double helix to open sufficiently for the binding of polymerases, transcription factors or regulatory molecules (*see* Gee et al., *In* Huber and Carr, *Molecular and Immunologic Approaches*, Futura Publishing Co. (Mt. Kisco, NY; 1994)). Alternatively, an antisense molecule may be designed to hybridize with a control region of a gene (*e.g.*, promoter, enhancer or transcription initiation site), and block transcription of the gene; or to block translation by inhibiting binding of a transcript to ribosomes.

A portion of a coding sequence, or of a complementary sequence, may also be designed as a probe or primer to detect gene expression. Probes may be labeled with a variety of reporter groups, such as radionuclides and enzymes, and are preferably at least 10 nucleotides in length, more preferably at least 20 nucleotides in length and

still more preferably at least 30 nucleotides in length. Primers, as noted above, are preferably 22-30 nucleotides in length.

Any polynucleotide may be further modified to increase stability *in vivo*. Possible modifications include, but are not limited to, the addition of flanking sequences at the 5' and/or 3' ends; the use of phosphorothioate or 2' O-methyl rather than phosphodiesterase linkages in the backbone; and/or the inclusion of nontraditional bases such as inosine, queosine and wybutosine, as well as acetyl-, methyl-, thio- and other modified forms of adenine, cytidine, guanine, thymine and uridine.

Nucleotide sequences as described herein may be joined to a variety of other nucleotide sequences using established recombinant DNA techniques. For example, a polynucleotide may be cloned into any of a variety of cloning vectors, including plasmids, phagemids, lambda phage derivatives and cosmids. Vectors of particular interest include expression vectors, replication vectors, probe generation vectors and sequencing vectors. In general, a vector will contain an origin of replication functional in at least one organism, convenient restriction endonuclease sites and one or more selectable markers. Other elements will depend upon the desired use, and will be apparent to those of ordinary skill in the art.

Within certain embodiments, polynucleotides may be formulated so as to permit entry into a cell of a mammal, and expression therein. Such formulations are particularly useful for therapeutic purposes, as described below. Those of ordinary skill in the art will appreciate that there are many ways to achieve expression of a polynucleotide in a target cell, and any suitable method may be employed. For example, a polynucleotide may be incorporated into a viral vector such as, but not limited to, adenovirus, adeno-associated virus, retrovirus, or vaccinia or other pox virus (*e.g.*, avian pox virus). The polynucleotides may also be administered as naked plasmid vectors. Techniques for incorporating DNA into such vectors are well known to those of ordinary skill in the art. A retroviral vector may additionally transfer or incorporate a gene for a selectable marker (to aid in the identification or selection of transduced cells) and/or a targeting moiety, such as a gene that encodes a ligand for a receptor on a specific target cell, to render the vector target specific. Targeting may also be accomplished using an antibody, by methods known to those of ordinary skill in the art.

Other formulations for therapeutic purposes include colloidal dispersion systems, such as macromolecule complexes, nanocapsules, microspheres, beads, and lipid-based systems including oil-in-water emulsions, micelles, mixed micelles, and liposomes. A preferred colloidal system for use as a delivery vehicle *in vitro* and *in vivo* is a liposome (*i.e.*, an artificial membrane vesicle). The preparation and use of such systems is well known in the art.

BREAST TUMOR POLYPEPTIDES

Within the context of the present invention, polypeptides may comprise at least an immunogenic portion of a breast tumor protein or a variant thereof, as described herein. As noted above, a "breast tumor protein" is a protein that is expressed by breast tumor cells. Proteins that are breast tumor proteins also react detectably within an immunoassay (such as an ELISA) with antisera from a patient with breast cancer. Polypeptides as described herein may be of any length. Additional sequences derived from the native protein and/or heterologous sequences may be present, and such sequences may (but need not) possess further immunogenic or antigenic properties.

An "immunogenic portion," as used herein is a portion of a protein that is

recognized (*i.e.*, specifically bound) by a B-cell and/or T-cell surface antigen receptor. Such immunogenic portions generally comprise at least 5 amino acid residues, more preferably at least 10, and still more preferably at least 20 amino acid residues of a breast tumor protein or a variant thereof. Certain preferred immunogenic portions include peptides in which an N-terminal leader sequence and/or transmembrane domain have been deleted. Other preferred immunogenic portions may contain a small N- and/or C-terminal deletion (*e.g.*, 1-30 amino acids, preferably 5-15 amino acids), relative to the mature protein.

Immunogenic portions may generally be identified using well known techniques, such as those summarized in Paul, *Fundamental Immunology*, 3rd ed., 243-247 (Raven Press, 1993) and references cited therein. Such techniques include screening polypeptides for the ability to react with antigen-specific antibodies, antisera and/or T-cell lines or clones. As used herein, antisera and antibodies are "antigen-specific" if they specifically bind to an antigen (*i.e.*, they react with the protein in an ELISA or other immunoassay, and do not react detectably with unrelated proteins). Such antisera and antibodies may be prepared as described herein, and using well known techniques. An immunogenic portion of a native breast tumor protein is a portion that reacts with such antisera and/or T-cells at a level that is not substantially less than the reactivity of the full length polypeptide (*e.g.*, in an ELISA and/or T-cell reactivity assay). Such immunogenic portions may react within such assays at a level that is similar to or greater than the reactivity of the full length polypeptide. Such screens may generally be performed using methods well known to those of ordinary skill in the art, such as those described in Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. For example, a polypeptide may be immobilized on a solid support and contacted with patient sera to allow binding of antibodies within the sera to the immobilized polypeptide. Unbound sera may then be removed and bound antibodies detected using, for example, ¹²⁵I-labeled Protein A.

As noted above, a composition may comprise a variant of a native breast tumor protein. A polypeptide "variant," as used herein, is a polypeptide that differs from a native breast tumor protein in one or more substitutions, deletions, additions and/or insertions, such that the immunogenicity of the polypeptide is not substantially

diminished. In other words, the ability of a variant to react with antigen-specific antisera may be enhanced or unchanged, relative to the native protein, or may be diminished by less than 50%, and preferably less than 20%, relative to the native protein. Such variants may generally be identified by modifying one of the above polypeptide sequences and evaluating the reactivity of the modified polypeptide with antigen-specific antibodies or antisera as described herein. Preferred variants include those in which one or more portions, such as an N-terminal leader sequence or transmembrane domain, have been removed. Other preferred variants include variants in which a small portion (*e.g.*, 1-30 amino acids, preferably 5-15 amino acids) has been removed from the N- and/or C-terminal of the mature protein.

Polypeptide variants preferably exhibit at least about 70%, more preferably at least about 90% and most preferably at least about 95% identity (determined as described above) to the identified polypeptides.

Preferably, a variant contains conservative substitutions. A "conservative substitution" is one in which an amino acid is substituted for another amino acid that has similar properties, such that one skilled in the art of peptide chemistry would expect the secondary structure and hydropathic nature of the polypeptide to be substantially unchanged. Amino acid substitutions may generally be made on the basis of similarity in polarity, charge, solubility, hydrophobicity, hydrophilicity and/or the amphipathic nature of the residues. For example, negatively charged amino acids include aspartic acid and glutamic acid; positively charged amino acids include lysine and arginine; and amino acids with uncharged polar head groups having similar hydrophilicity values include leucine, isoleucine and valine; glycine and alanine; asparagine and glutamine; and serine, threonine, phenylalanine and tyrosine. Other groups of amino acids that may represent conservative changes include: (1) ala, pro, gly, glu, asp, gln, asn, ser, thr; (2) cys, ser, tyr, thr; (3) val, ile, leu, met, ala, phe; (4) lys, arg, his; and (5) phe, tyr, trp, his. A variant may also, or alternatively, contain nonconservative changes. In a preferred embodiment, variant polypeptides differ from a native sequence by substitution, deletion or addition of five amino acids or fewer. Variants may also (or alternatively) be modified by, for example, the deletion or addition of amino acids that have minimal influence on the immunogenicity, secondary structure and hydropathic nature of the polypeptide.

As noted above, polypeptides may comprise a signal (or leader) sequence at the N-terminal end of the protein which co-translationally or post-translationally directs transfer of the protein. The polypeptide may also be conjugated to a linker or other sequence for ease of synthesis, purification or identification of the polypeptide (e.g., poly-His), or to enhance binding of the polypeptide to a solid support. For example, a polypeptide may be conjugated to an immunoglobulin Fc region.

Polypeptides may be prepared using any of a variety of well known techniques. Recombinant polypeptides encoded by DNA sequences as described above may be readily prepared from the DNA sequences using any of a variety of expression vectors known to those of ordinary skill in the art. Expression may be achieved in any appropriate host cell that has been transformed or transfected with an expression vector containing a DNA molecule that encodes a recombinant polypeptide. Suitable host cells include prokaryotes, yeast, higher eukaryotic and plant cells. Preferably, the host cells employed are *E. coli*, yeast or a mammalian cell line such as COS or CHO. Supernatants from suitable host/vector systems which secrete recombinant protein or polypeptide into culture media may be first concentrated using a commercially available filter. Following concentration, the concentrate may be applied to a suitable purification matrix such as an affinity matrix or an ion exchange resin. Finally, one or more reverse phase HPLC steps can be employed to further purify a recombinant polypeptide.

Portions and other variants having fewer than about 100 amino acids, and generally fewer than about 50 amino acids, may also be generated by synthetic means, using techniques well known to those of ordinary skill in the art. For example, such polypeptides may be synthesized using any of the commercially available solid-phase techniques, such as the Merrifield solid-phase synthesis method, where amino acids are sequentially added to a growing amino acid chain. See Merrifield, *J. Am. Chem. Soc.* 85:2149-2146, 1963. Equipment for automated synthesis of polypeptides is commercially available from suppliers such as Perkin Elmer/Applied BioSystems Division (Foster City, CA), and may be operated according to the manufacturer's instructions.

Within certain specific embodiments, a polypeptide may be a fusion protein that comprises multiple polypeptides as described herein, or that comprises at

least one polypeptide as described herein and an unrelated sequence, such as a known tumor protein. A fusion partner may, for example, assist in providing T helper epitopes (an immunological fusion partner), preferably T helper epitopes recognized by humans, or may assist in expressing the protein (an expression enhancer) at higher yields than the native recombinant protein. Certain preferred fusion partners are both immunological and expression enhancing fusion partners. Other fusion partners may be selected so as to increase the solubility of the protein or to enable the protein to be targeted to desired intracellular compartments. Still further fusion partners include affinity tags, which facilitate purification of the protein.

Fusion proteins may generally be prepared using standard techniques, including chemical conjugation. Preferably, a fusion protein is expressed as a recombinant protein, allowing the production of increased levels, relative to a non-fused protein, in an expression system. Briefly, DNA sequences encoding the polypeptide components may be assembled separately, and ligated into an appropriate expression vector. The 3' end of the DNA sequence encoding one polypeptide component is ligated, with or without a peptide linker, to the 5' end of a DNA sequence encoding the second polypeptide component so that the reading frames of the sequences are in phase. This permits translation into a single fusion protein that retains the biological activity of both component polypeptides.

A peptide linker sequence may be employed to separate the first and the second polypeptide components by a distance sufficient to ensure that each polypeptide folds into its secondary and tertiary structures. Such a peptide linker sequence is incorporated into the fusion protein using standard techniques well known in the art. Suitable peptide linker sequences may be chosen based on the following factors: (1) their ability to adopt a flexible extended conformation; (2) their inability to adopt a secondary structure that could interact with functional epitopes on the first and second polypeptides; and (3) the lack of hydrophobic or charged residues that might react with the polypeptide functional epitopes. Preferred peptide linker sequences contain Gly, Asn and Ser residues. Other near neutral amino acids, such as Thr and Ala may also be used in the linker sequence. Amino acid sequences which may be usefully employed as linkers include those disclosed in Maratea et al., *Gene* 40:39-46, 1985; Murphy et al.,

Proc. Natl. Acad. Sci. USA 83:8258-8262, 1986; U.S. Patent No. 4,935,233 and U.S. Patent No. 4,751,180. The linker sequence may generally be from 1 to about 50 amino acids in length. Linker sequences are not required when the first and second polypeptides have non-essential N-terminal amino acid regions that can be used to separate the functional domains and prevent steric interference.

The ligated DNA sequences are operably linked to suitable transcriptional or translational regulatory elements. The regulatory elements responsible for expression of DNA are located only 5' to the DNA sequence encoding the first polypeptides. Similarly, stop codons required to end translation and transcription termination signals are only present 3' to the DNA sequence encoding the second polypeptide.

Fusion proteins are also provided that comprise a polypeptide of the present invention together with an unrelated immunogenic protein. Preferably the immunogenic protein is capable of eliciting a recall response. Examples of such proteins include tetanus, tuberculosis and hepatitis proteins (*see, for example, Stoute et al. New Engl. J. Med.*, 336:86-91, 1997).

Within preferred embodiments, an immunological fusion partner is derived from protein D, a surface protein of the gram-negative bacterium *Haemophilus influenza B* (WO 91/18926). Preferably, a protein D derivative comprises approximately the first third of the protein (*e.g.*, the first N-terminal 100-110 amino acids), and a protein D derivative may be lipidated. Within certain preferred embodiments, the first 109 residues of a Lipoprotein D fusion partner is included on the N-terminus to provide the polypeptide with additional exogenous T-cell epitopes and to increase the expression level in *E. coli* (thus functioning as an expression enhancer). The lipid tail ensures optimal presentation of the antigen to antigen presenting cells. Other fusion partners include the non-structural protein from influenzae virus, NS1 (hemagglutinin). Typically, the N-terminal 81 amino acids are used, although different fragments that include T-helper epitopes may be used.

In another embodiment, the immunological fusion partner is the protein known as LYTA, or a portion thereof (preferably a C-terminal portion). LYTA is derived from *Streptococcus pneumoniae*, which synthesizes an N-acetyl-L-alanine amidase known as amidase LYTA (encoded by the *LytA* gene; *Gene* 43:265-292, 1986).

LYTA is an autolysin that specifically degrades certain bonds in the peptidoglycan backbone. The C-terminal domain of the LYTA protein is responsible for the affinity to the choline or to some choline analogues such as DEAE. This property has been exploited for the development of *E. coli* C-LYTA expressing plasmids useful for expression of fusion proteins. Purification of hybrid proteins containing the C-LYTA fragment at the amino terminus has been described (*see Biotechnology 10:795-798, 1992*). Within a preferred embodiment, a repeat portion of LYTA may be incorporated into a fusion protein. A repeat portion is found in the C-terminal region starting at residue 178. A particularly preferred repeat portion incorporates residues 188-305.

In general, polypeptides (including fusion proteins) and polynucleotides as described herein are isolated. An "isolated" polypeptide or polynucleotide is one that is removed from its original environment. For example, a naturally-occurring protein is isolated if it is separated from some or all of the coexisting materials in the natural system. Preferably, such polypeptides are at least about 90% pure, more preferably at least about 95% pure and most preferably at least about 99% pure. A polynucleotide is considered to be isolated if, for example, it is cloned into a vector that is not a part of the natural environment.

BINDING AGENTS

The present invention further provides agents, such as antibodies and antigen-binding fragments thereof, that specifically bind to a breast tumor protein. As used herein, an antibody, or antigen-binding fragment thereof, is said to "specifically bind" to a breast tumor protein if it reacts at a detectable level (within, for example, an ELISA) with a breast tumor protein, and does not react detectably with unrelated proteins under similar conditions. As used herein, "binding" refers to a noncovalent association between two separate molecules such that a complex is formed. The ability to bind may be evaluated by, for example, determining a binding constant for the formation of the complex. The binding constant is the value obtained when the concentration of the complex is divided by the product of the component concentrations. In general, two compounds are said to "bind," in the context of the present invention, when the binding constant for complex formation exceeds about 10^3 L/mol. The binding constant may be

determined using methods well known in the art.

Binding agents may be further capable of differentiating between patients with and without a cancer, such as breast cancer, using the representative assays provided herein. In other words, antibodies or other binding agents that bind to a breast tumor protein will generate a signal indicating the presence of a cancer in at least about 20% of patients with the disease, and will generate a negative signal indicating the absence of the disease in at least about 90% of individuals without the cancer. To determine whether a binding agent satisfies this requirement, biological samples (*e.g.*, blood, sera, urine and/or tumor biopsies) from patients with and without a cancer (as determined using standard clinical tests) may be assayed as described herein for the presence of polypeptides that bind to the binding agent. It will be apparent that a statistically significant number of samples with and without the disease should be assayed. Each binding agent should satisfy the above criteria; however, those of ordinary skill in the art will recognize that binding agents may be used in combination to improve sensitivity.

Any agent that satisfies the above requirements may be a binding agent. For example, a binding agent may be a ribosome, with or without a peptide component, an RNA molecule or a polypeptide. In a preferred embodiment, a binding agent is an antibody or an antigen-binding fragment thereof. Antibodies may be prepared by any of a variety of techniques known to those of ordinary skill in the art. *See, e.g.*, Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. In general, antibodies can be produced by cell culture techniques, including the generation of monoclonal antibodies as described herein, or via transfection of antibody genes into suitable bacterial or mammalian cell hosts, in order to allow for the production of recombinant antibodies. In one technique, an immunogen comprising the polypeptide is initially injected into any of a wide variety of mammals (*e.g.*, mice, rats, rabbits, sheep or goats). In this step, the polypeptides of this invention may serve as the immunogen without modification. Alternatively, particularly for relatively short polypeptides, a superior immune response may be elicited if the polypeptide is joined to a carrier protein, such as bovine serum albumin or keyhole limpet hemocyanin. The immunogen is injected into the animal host, preferably according to a predetermined schedule incorporating one or more booster immunizations, and the animals are bled periodically.

Polyclonal antibodies specific for the polypeptide may then be purified from such antisera by, for example, affinity chromatography using the polypeptide coupled to a suitable solid support.

Monoclonal antibodies specific for an antigenic polypeptide of interest may be prepared, for example, using the technique of Kohler and Milstein, *Eur. J. Immunol.* 6:511-519, 1976, and improvements thereto. Briefly, these methods involve the preparation of immortal cell lines capable of producing antibodies having the desired specificity (*i.e.*, reactivity with the polypeptide of interest). Such cell lines may be produced, for example, from spleen cells obtained from an animal immunized as described above. The spleen cells are then immortalized by, for example, fusion with a myeloma cell fusion partner, preferably one that is syngeneic with the immunized animal. A variety of fusion techniques may be employed. For example, the spleen cells and myeloma cells may be combined with a nonionic detergent for a few minutes and then plated at low density on a selective medium that supports the growth of hybrid cells, but not myeloma cells. A preferred selection technique uses HAT (hypoxanthine, aminopterin, thymidine) selection. After a sufficient time, usually about 1 to 2 weeks, colonies of hybrids are observed. Single colonies are selected and their culture supernatants tested for binding activity against the polypeptide. Hybridomas having high reactivity and specificity are preferred.

Monoclonal antibodies may be isolated from the supernatants of growing hybridoma colonies. In addition, various techniques may be employed to enhance the yield, such as injection of the hybridoma cell line into the peritoneal cavity of a suitable vertebrate host, such as a mouse. Monoclonal antibodies may then be harvested from the ascites fluid or the blood. Contaminants may be removed from the antibodies by conventional techniques, such as chromatography, gel filtration, precipitation, and extraction. The polypeptides of this invention may be used in the purification process in, for example, an affinity chromatography step.

Within certain embodiments, the use of antigen-binding fragments of antibodies may be preferred. Such fragments include Fab fragments, which may be prepared using standard techniques. Briefly, immunoglobulins may be purified from rabbit serum by affinity chromatography on Protein A bead columns (Harlow and Lane,

Antibodies: A Laboratory Manual, Cold Spring Harbor Laboratory, 1988) and digested by papain to yield Fab and Fc fragments. The Fab and Fc fragments may be separated by affinity chromatography on protein A bead columns.

Monoclonal antibodies of the present invention may be coupled to one or more therapeutic agents. Suitable agents in this regard include radionuclides, differentiation inducers, drugs, toxins, and derivatives thereof. Preferred radionuclides include ^{90}Y , ^{123}I , ^{125}I , ^{131}I , ^{186}Re , ^{188}Re , ^{211}At , and ^{212}Bi . Preferred drugs include methotrexate, and pyrimidine and purine analogs. Preferred differentiation inducers include phorbol esters and butyric acid. Preferred toxins include ricin, abrin, diphtheria toxin, cholera toxin, gelonin, *Pseudomonas* exotoxin, *Shigella* toxin, and pokeweed antiviral protein.

A therapeutic agent may be coupled (*e.g.*, covalently bonded) to a suitable monoclonal antibody either directly or indirectly (*e.g.*, via a linker group). A direct reaction between an agent and an antibody is possible when each possesses a substituent capable of reacting with the other. For example, a nucleophilic group, such as an amino or sulfhydryl group, on one may be capable of reacting with a carbonyl-containing group, such as an anhydride or an acid halide, or with an alkyl group containing a good leaving group (*e.g.*, a halide) on the other.

Alternatively, it may be desirable to couple a therapeutic agent and an antibody via a linker group. A linker group can function as a spacer to distance an antibody from an agent in order to avoid interference with binding capabilities. A linker group can also serve to increase the chemical reactivity of a substituent on an agent or an antibody, and thus increase the coupling efficiency. An increase in chemical reactivity may also facilitate the use of agents, or functional groups on agents, which otherwise would not be possible.

It will be evident to those skilled in the art that a variety of bifunctional or polyfunctional reagents, both homo- and hetero-functional (such as those described in the catalog of the Pierce Chemical Co., Rockford, IL), may be employed as the linker group. Coupling may be effected, for example, through amino groups, carboxyl groups, sulfhydryl groups or oxidized carbohydrate residues. There are numerous references describing such methodology, *e.g.*, U.S. Patent No. 4,671,958, to Rodwell et al.

Where a therapeutic agent is more potent when free from the antibody portion of the immunoconjugates of the present invention, it may be desirable to use a linker group which is cleavable during or upon internalization into a cell. A number of different cleavable linker groups have been described. The mechanisms for the intracellular release of an agent from these linker groups include cleavage by reduction of a disulfide bond (*e.g.*, U.S. Patent No. 4,489,710, to Spitler), by irradiation of a photolabile bond (*e.g.*, U.S. Patent No. 4,625,014, to Senter et al.), by hydrolysis of derivatized amino acid side chains (*e.g.*, U.S. Patent No. 4,638,045, to Kohn et al.), by serum complement-mediated hydrolysis (*e.g.*, U.S. Patent No. 4,671,958, to Rodwell et al.), and acid-catalyzed hydrolysis (*e.g.*, U.S. Patent No. 4,569,789, to Blattler et al.).

It may be desirable to couple more than one agent to an antibody. In one embodiment, multiple molecules of an agent are coupled to one antibody molecule. In another embodiment, more than one type of agent may be coupled to one antibody. Regardless of the particular embodiment, immunoconjugates with more than one agent may be prepared in a variety of ways. For example, more than one agent may be coupled directly to an antibody molecule, or linkers which provide multiple sites for attachment can be used. Alternatively, a carrier can be used.

A carrier may bear the agents in a variety of ways, including covalent bonding either directly or via a linker group. Suitable carriers include proteins such as albumins (*e.g.*, U.S. Patent No. 4,507,234, to Kato et al.), peptides and polysaccharides such as aminodextran (*e.g.*, U.S. Patent No. 4,699,784, to Shih et al.). A carrier may also bear an agent by noncovalent bonding or by encapsulation, such as within a liposome vesicle (*e.g.*, U.S. Patent Nos. 4,429,008 and 4,873,088). Carriers specific for radionuclide agents include radiohalogenated small molecules and chelating compounds. For example, U.S. Patent No. 4,735,792 discloses representative radiohalogenated small molecules and their synthesis. A radionuclide chelate may be formed from chelating compounds that include those containing nitrogen and sulfur atoms as the donor atoms for binding the metal, or metal oxide, radionuclide. For example, U.S. Patent No. 4,673,562, to Davison et al. discloses representative chelating compounds and their synthesis.

A variety of routes of administration for the antibodies and

immunoconjugates may be used. Typically, administration will be intravenous, intramuscular, subcutaneous or in the bed of a resected tumor. It will be evident that the precise dose of the antibody/immunoconjugate will vary depending upon the antibody used, the antigen density on the tumor, and the rate of clearance of the antibody.

T CELLS

Immunotherapeutic compositions may also, or alternatively, comprise T cells specific for a breast tumor protein. Such cells may generally be prepared *in vitro* or *ex vivo*, using standard procedures. For example, T cells may be isolated from bone marrow, peripheral blood, or a fraction of bone marrow or peripheral blood of a patient, using a commercially available cell separation system, such as the ISOLEX™ system, available from Nexell Therapeutics Inc., Irvine, CA (see also U.S. Patent No. 5,240,856; U.S. Patent No. 5,215,926; WO 89/06280; WO 91/16116 and WO 92/07243). Alternatively, T cells may be derived from related or unrelated humans, non-human mammals, cell lines or cultures.

T cells may be stimulated with a breast tumor polypeptide, polynucleotide encoding a breast tumor polypeptide and/or an antigen presenting cell (APC) that expresses such a polypeptide. Such stimulation is performed under conditions and for a time sufficient to permit the generation of T cells that are specific for the polypeptide. Preferably, a breast tumor polypeptide or polynucleotide is present within a delivery vehicle, such as a microsphere, to facilitate the generation of specific T cells.

T cells are considered to be specific for a breast tumor polypeptide if the T cells kill target cells coated with the polypeptide or expressing a gene encoding the polypeptide. T cell specificity may be evaluated using any of a variety of standard techniques. For example, within a chromium release assay or proliferation assay, a stimulation index of more than two fold increase in lysis and/or proliferation, compared to negative controls, indicates T cell specificity. Such assays may be performed, for example, as described in Chen et al., *Cancer Res.* 54:1065-1070, 1994. Alternatively, detection of the proliferation of T cells may be accomplished by a variety of known techniques. For example, T cell proliferation can be detected by measuring an increased

rate of DNA synthesis (*e.g.*, by pulse-labeling cultures of T cells with tritiated thymidine and measuring the amount of tritiated thymidine incorporated into DNA). Contact with a breast tumor polypeptide (100 ng/ml - 100 µg/ml, preferably 200 ng/ml - 25 µg/ml) for 3 - 7 days should result in at least a two fold increase in proliferation of the T cells. Contact as described above for 2-3 hours should result in activation of the T cells, as measured using standard cytokine assays in which a two fold increase in the level of cytokine release (*e.g.*, TNF or IFN-γ) is indicative of T cell activation (*see* Coligan et al., Current Protocols in Immunology, vol. 1, Wiley Interscience (Greene 1998)). T cells that have been activated in response to a breast tumor polypeptide, polynucleotide or polypeptide-expressing APC may be CD4⁺ and/or CD8⁺. Breast tumor protein-specific T cells may be expanded using standard techniques. Within preferred embodiments, the T cells are derived from either a patient or a related, or unrelated, donor and are administered to the patient following stimulation and expansion.

For therapeutic purposes, CD4⁺ or CD8⁺ T cells that proliferate in response to a breast tumor polypeptide, polynucleotide or APC can be expanded in number either *in vitro* or *in vivo*. Proliferation of such T cells *in vitro* may be accomplished in a variety of ways. For example, the T cells can be re-exposed to a breast tumor polypeptide, or a short peptide corresponding to an immunogenic portion of such a polypeptide, with or without the addition of T cell growth factors, such as interleukin-2, and/or stimulator cells that synthesize a breast tumor polypeptide. Alternatively, one or more T cells that proliferate in the presence of a breast tumor protein can be expanded in number by cloning. Methods for cloning cells are well known in the art, and include limiting dilution.

PHARMACEUTICAL COMPOSITIONS AND VACCINES

Within certain aspects, polypeptides, polynucleotides, T cells and/or binding agents disclosed herein may be incorporated into pharmaceutical compositions or immunogenic compositions (*i.e.*, vaccines). Pharmaceutical compositions comprise one or more such compounds and a physiologically acceptable carrier. Vaccines may comprise one or more such compounds and an immunostimulant. An immunostimulant

may be any substance that enhances an immune response to an exogenous antigen. Examples of immunostimulants include adjuvants, biodegradable microspheres (e.g., polylactic galactide) and liposomes (into which the compound is incorporated; see e.g., Fullerton, U.S. Patent No. 4,235,877). Vaccine preparation is generally described in, for example, M.F. Powell and M.J. Newman, eds., "Vaccine Design (the subunit and adjuvant approach)," Plenum Press (NY, 1995). Pharmaceutical compositions and vaccines within the scope of the present invention may also contain other compounds, which may be biologically active or inactive. For example, one or more immunogenic portions of other tumor antigens may be present, either incorporated into a fusion polypeptide or as a separate compound, within the composition or vaccine.

A pharmaceutical composition or vaccine may contain DNA encoding one or more of the polypeptides as described above, such that the polypeptide is generated *in situ*. As noted above, the DNA may be present within any of a variety of delivery systems known to those of ordinary skill in the art, including nucleic acid expression systems, bacteria and viral expression systems. Numerous gene delivery techniques are well known in the art, such as those described by Rolland, *Crit. Rev. Therap. Drug Carrier Systems* 15:143-198, 1998, and references cited therein. Appropriate nucleic acid expression systems contain the necessary DNA sequences for expression in the patient (such as a suitable promoter and terminating signal). Bacterial delivery systems involve the administration of a bacterium (such as *Bacillus-Calmette-Guerrin*) that expresses an immunogenic portion of the polypeptide on its cell surface or secretes such an epitope. In a preferred embodiment, the DNA may be introduced using a viral expression system (e.g., vaccinia or other pox virus, retrovirus, or adenovirus), which may involve the use of a non-pathogenic (defective), replication competent virus. Suitable systems are disclosed, for example, in Fisher-Hoch et al., *Proc. Natl. Acad. Sci. USA* 86:317-321, 1989; Flexner et al., *Ann. N.Y. Acad. Sci.* 569:86-103, 1989; Flexner et al., *Vaccine* 8:17-21, 1990; U.S. Patent Nos. 4,603,112, 4,769,330, and 5,017,487; WO 89/01973; U.S. Patent No. 4,777,127; GB 2,200,651; EP 0,345,242; WO 91/02805; Berkner, *Biotechniques* 6:616-627, 1988; Rosenfeld et al., *Science* 252:431-434, 1991; Kolls et al., *Proc. Natl. Acad. Sci. USA* 91:215-219, 1994; Kass-Eisler et al., *Proc. Natl. Acad. Sci. USA* 90:11498-11502, 1993; Guzman et al., *Circulation* 88:2838-2848, 1993;

and Guzman et al., *Cir. Res.* 73:1202-1207, 1993. Techniques for incorporating DNA into such expression systems are well known to those of ordinary skill in the art. The DNA may also be "naked," as described, for example, in Ulmer et al., *Science* 259:1745-1749, 1993 and reviewed by Cohen, *Science* 259:1691-1692, 1993. The uptake of naked DNA may be increased by coating the DNA onto biodegradable beads, which are efficiently transported into the cells.

While any suitable carrier known to those of ordinary skill in the art may be employed in the pharmaceutical compositions of this invention, the type of carrier will vary depending on the mode of administration. Compositions of the present invention may be formulated for any appropriate manner of administration, including for example, topical, oral, nasal, intravenous, intracranial, intraperitoneal, subcutaneous or intramuscular administration. For parenteral administration, such as subcutaneous injection, the carrier preferably comprises water, saline, alcohol, a fat, a wax or a buffer. For oral administration, any of the above carriers or a solid carrier, such as mannitol, lactose, starch, magnesium stearate, sodium saccharine, talcum, cellulose, glucose, sucrose, and magnesium carbonate, may be employed. Biodegradable microspheres (e.g., polylactate polyglycolate) may also be employed as carriers for the pharmaceutical compositions of this invention. Suitable biodegradable microspheres are disclosed, for example, in U.S. Patent Nos. 4,897,268 and 5,075,109.

Such compositions may also comprise buffers (e.g., neutral buffered saline or phosphate buffered saline), carbohydrates (e.g., glucose, mannose, sucrose or dextrans), mannitol, proteins, polypeptides or amino acids such as glycine, antioxidants, chelating agents such as EDTA or glutathione, adjuvants (e.g., aluminum hydroxide) and/or preservatives. Alternatively, compositions of the present invention may be formulated as a lyophilizate. Compounds may also be encapsulated within liposomes using well known technology.

Any of a variety of immunostimulants may be employed in the vaccines of this invention. For example, an adjuvant may be included. Most adjuvants contain a substance designed to protect the antigen from rapid catabolism, such as aluminum hydroxide or mineral oil, and a stimulator of immune responses, such as lipid A, *Bordetella pertussis* or *Mycobacterium tuberculosis* derived proteins. Suitable adjuvants

are commercially available as, for example, Freund's Incomplete Adjuvant and Complete Adjuvant (Difco Laboratories, Detroit, MI); Merck Adjuvant 65 (Merck and Company, Inc., Rahway, NJ); aluminum salts such as aluminum hydroxide gel (alum) or aluminum phosphate; salts of calcium, iron or zinc; an insoluble suspension of acylated tyrosine; acylated sugars; cationically or anionically derivatized polysaccharides; polyphosphazenes; biodegradable microspheres; monophosphoryl lipid A and quil A. Cytokines, such as GM-CSF or interleukin-2, -7, or -12, may also be used as adjuvants.

Within the vaccines provided herein, the adjuvant composition is preferably designed to induce an immune response predominantly of the Th1 type. High levels of Th1-type cytokines (*e.g.*, IFN- γ , TNF- α , IL-2 and IL-12) tend to favor the induction of cell mediated immune responses to an administered antigen. In contrast, high levels of Th2-type cytokines (*e.g.*, IL-4, IL-5, IL-6 and IL-10) tend to favor the induction of humoral immune responses. Following application of a vaccine as provided herein, a patient will support an immune response that includes Th1- and Th2-type responses. Within a preferred embodiment, in which a response is predominantly Th1-type, the level of Th1-type cytokines will increase to a greater extent than the level of Th2-type cytokines. The levels of these cytokines may be readily assessed using standard assays. For a review of the families of cytokines, see Mosmann and Coffman, *Ann. Rev. Immunol.* 7:145-173, 1989.

Preferred adjuvants for use in eliciting a predominantly Th1-type response include, for example, a combination of monophosphoryl lipid A, preferably 3-de-O-acylated monophosphoryl lipid A (3D-MPL), together with an aluminum salt. MPL adjuvants are available from Ribic ImmunoChem Research Inc. (Hamilton, MT) (*see* US Patent Nos. 4,436,727; 4,877,611; 4,866,034 and 4,912,094). CpG-containing oligonucleotides (in which the CpG dinucleotide is unmethylated) also induce a predominantly Th1 response. Such oligonucleotides are well known and are described, for example, in WO 96/02555. Another preferred adjuvant is a saponin, preferably QS21, which may be used alone or in combination with other adjuvants. For example, an enhanced system involves the combination of a monophosphoryl lipid A and saponin derivative, such as the combination of QS21 and 3D-MPL as described in WO 94/00153,

or a less reactogenic composition where the QS21 is quenched with cholesterol, as described in WO 96/33739. Other preferred formulations comprises an oil-in-water emulsion and tocopherol. A particularly potent adjuvant formulation involving QS21, 3D-MPL and tocopherol in an oil-in-water emulsion is described in WO 95/17210. Any vaccine provided herein may be prepared using well known methods that result in a combination of antigen, immune response enhancer and a suitable carrier or excipient.

The compositions described herein may be administered as part of a sustained release formulation (*i.e.*, a formulation such as a capsule, sponge or gel (composed of polysaccharides, for example) that effects a slow release of compound following administration). Such formulations may generally be prepared using well known technology and administered by, for example, oral, rectal or subcutaneous implantation, or by implantation at the desired target site. Sustained-release formulations may contain a polypeptide, polynucleotide or antibody dispersed in a carrier matrix and/or contained within a reservoir surrounded by a rate controlling membrane. Carriers for use within such formulations are biocompatible, and may also be biodegradable; preferably the formulation provides a relatively constant level of active component release. The amount of active compound contained within a sustained release formulation depends upon the site of implantation, the rate and expected duration of release and the nature of the condition to be treated or prevented.

Any of a variety of delivery vehicles may be employed within pharmaceutical compositions and vaccines to facilitate production of an antigen-specific immune response that targets tumor cells. Delivery vehicles include antigen presenting cells (APCs), such as dendritic cells, macrophages, B cells, monocytes and other cells that may be engineered to be efficient APCs. Such cells may, but need not, be genetically modified to increase the capacity for presenting the antigen, to improve activation and/or maintenance of the T cell response, to have anti-tumor effects *per se* and/or to be immunologically compatible with the receiver (*i.e.*, matched HLA haplotype). APCs may generally be isolated from any of a variety of biological fluids and organs, including tumor and peritumoral tissues, and may be autologous, allogeneic, syngeneic or xenogeneic cells.

Certain preferred embodiments of the present invention use dendritic cells

or progenitors thereof as antigen-presenting cells. Dendritic cells are highly potent APCs (Banchereau and Steinman, *Nature* 392:245-251, 1998) and have been shown to be effective as a physiological adjuvant for eliciting prophylactic or therapeutic antitumor immunity (see Timmerman and Levy, *Ann. Rev. Med.* 50:507-529, 1999). In general, dendritic cells may be identified based on their typical shape (stellate *in situ*, with marked cytoplasmic processes (dendrites) visible *in vitro*), their ability to take up, process and present antigens with high efficiency, and their ability to activate naïve T cell responses. Dendritic cells may, of course, be engineered to express specific cell-surface receptors or ligands that are not commonly found on dendritic cells *in vivo* or *ex vivo*, and such modified dendritic cells are contemplated by the present invention. As an alternative to dendritic cells, secreted vesicles antigen-loaded dendritic cells (called exosomes) may be used within a vaccine (see Zitvogel et al., *Nature Med.* 4:594-600, 1998).

Dendritic cells and progenitors may be obtained from peripheral blood, bone marrow, tumor-infiltrating cells, peritumoral tissues-infiltrating cells, lymph nodes, spleen, skin, umbilical cord blood or any other suitable tissue or fluid. For example, dendritic cells may be differentiated *ex vivo* by adding a combination of cytokines such as GM-CSF, IL-4, IL-13 and/or TNF α to cultures of monocytes harvested from peripheral blood. Alternatively, CD34 positive cells harvested from peripheral blood, umbilical cord blood or bone marrow may be differentiated into dendritic cells by adding to the culture medium combinations of GM-CSF, IL-3, TNF α , CD40 ligand, LPS, flt3 ligand and/or other compound(s) that induce differentiation, maturation and proliferation of dendritic cells.

Dendritic cells are conveniently categorized as "immature" and "mature" cells, which allows a simple way to discriminate between two well characterized phenotypes. However, this nomenclature should not be construed to exclude all possible intermediate stages of differentiation. Immature dendritic cells are characterized as APC with a high capacity for antigen uptake and processing, which correlates with the high expression of Fc γ receptor and mannose receptor. The mature phenotype is typically characterized by a lower expression of these markers, but a high expression of cell

surface molecules responsible for T cell activation such as class I and class II MHC, adhesion molecules (*e.g.*, CD54 and CD11) and costimulatory molecules (*e.g.*, CD40, CD80, CD86 and 4-1BB).

APCs may generally be transfected with a polynucleotide encoding a breast tumor protein (or portion or other variant thereof) such that the breast tumor polypeptide, or an immunogenic portion thereof, is expressed on the cell surface. Such transfection may take place *ex vivo*, and a composition or vaccine comprising such transfected cells may then be used for therapeutic purposes, as described herein. Alternatively, a gene delivery vehicle that targets a dendritic or other antigen presenting cell may be administered to a patient, resulting in transfection that occurs *in vivo*. *In vivo* and *ex vivo* transfection of dendritic cells, for example, may generally be performed using any methods known in the art, such as those described in WO 97/24447, or the gene gun approach described by Mahvi et al., *Immunology and cell Biology* 75:456-460, 1997. Antigen loading of dendritic cells may be achieved by incubating dendritic cells or progenitor cells with the breast tumor polypeptide, DNA (naked or within a plasmid vector) or RNA; or with antigen-expressing recombinant bacterium or viruses (*e.g.*, vaccinia, fowlpox, adenovirus or lentivirus vectors). Prior to loading, the polypeptide may be covalently conjugated to an immunological partner that provides T cell help (*e.g.*, a carrier molecule). Alternatively, a dendritic cell may be pulsed with a non-conjugated immunological partner, separately or in the presence of the polypeptide.

CANCER THERAPY

In further aspects of the present invention, the compositions described herein may be used for immunotherapy of cancer, such as breast cancer. Within such methods, pharmaceutical compositions and vaccines are typically administered to a patient. As used herein, a "patient" refers to any warm-blooded animal, preferably a human. A patient may or may not be afflicted with cancer. Accordingly, the above pharmaceutical compositions and vaccines may be used to prevent the development of a cancer or to treat a patient afflicted with a cancer. A cancer may be diagnosed using criteria generally accepted in the art, including the presence of a malignant tumor. Pharmaceutical compositions and vaccines may be administered either prior to or

following surgical removal of primary tumors and/or treatment such as administration of radiotherapy or conventional chemotherapeutic drugs.

Within certain embodiments, immunotherapy may be active immunotherapy, in which treatment relies on the *in vivo* stimulation of the endogenous host immune system to react against tumors with the administration of immune response-modifying agents (such as polypeptides and polynucleotides disclosed herein).

Within other embodiments, immunotherapy may be passive immunotherapy, in which treatment involves the delivery of agents with established tumor-immune reactivity (such as effector cells or antibodies) that can directly or indirectly mediate antitumor effects and does not necessarily depend on an intact host immune system. Examples of effector cells include T cells as discussed above, T lymphocytes (such as CD8⁺ cytotoxic T lymphocytes and CD4⁺ T-helper tumor-infiltrating lymphocytes), killer cells (such as Natural Killer cells and lymphokine-activated killer cells), B cells and antigen-presenting cells (such as dendritic cells and macrophages) expressing a polypeptide provided herein. T cell receptors and antibody receptors specific for the polypeptides recited herein may be cloned, expressed and transferred into other vectors or effector cells for adoptive immunotherapy. The polypeptides provided herein may also be used to generate antibodies or anti-idiotypic antibodies (as described above and in U.S. Patent No. 4,918,164) for passive immunotherapy.

Effector cells may generally be obtained in sufficient quantities for adoptive immunotherapy by growth *in vitro*, as described herein. Culture conditions for expanding single antigen-specific effector cells to several billion in number with retention of antigen recognition *in vivo* are well known in the art. Such *in vitro* culture conditions typically use intermittent stimulation with antigen, often in the presence of cytokines (such as IL-2) and non-dividing feeder cells. As noted above, immunoreactive polypeptides as provided herein may be used to rapidly expand antigen-specific T cell cultures in order to generate a sufficient number of cells for immunotherapy. In particular, antigen-presenting cells, such as dendritic, macrophage, monocyte, fibroblast or B cells, may be pulsed with immunoreactive polypeptides or transfected with one or more polynucleotides using standard techniques well known in the art. For example,

antigen-presenting cells can be transfected with a polynucleotide having a promoter appropriate for increasing expression in a recombinant virus or other expression system. Cultured effector cells for use in therapy must be able to grow and distribute widely, and to survive long term *in vivo*. Studies have shown that cultured effector cells can be induced to grow *in vivo* and to survive long term in substantial numbers by repeated stimulation with antigen supplemented with IL-2 (*see, for example, Cheever et al., Immunological Reviews 157:177, 1997*).

Alternatively, a vector expressing a polypeptide recited herein may be introduced into antigen presenting cells taken from a patient and clonally propagated *ex vivo* for transplant back into the same patient. Transfected cells may be reintroduced into the patient using any means known in the art, preferably in sterile form by intravenous, intracavitary, intraperitoneal or intratumor administration.

Routes and frequency of administration of the therapeutic compositions disclosed herein, as well as dosage, will vary from individual to individual, and may be readily established using standard techniques. In general, the pharmaceutical compositions and vaccines may be administered by injection (*e.g.*, intracutaneous, intramuscular, intravenous or subcutaneous), intranasally (*e.g.*, by aspiration) or orally. Preferably, between 1 and 10 doses may be administered over a 52 week period. Preferably, 6 doses are administered, at intervals of 1 month, and booster vaccinations may be given periodically thereafter. Alternate protocols may be appropriate for individual patients. A suitable dose is an amount of a compound that, when administered as described above, is capable of promoting an anti-tumor immune response, and is at least 10-50% above the basal (*i.e.*, untreated) level. Such response can be monitored by measuring the anti-tumor antibodies in a patient or by vaccine-dependent generation of cytolytic effector cells capable of killing the patient's tumor cells *in vitro*. Such vaccines should also be capable of causing an immune response that leads to an improved clinical outcome (*e.g.*, more frequent remissions, complete or partial or longer disease-free survival) in vaccinated patients as compared to non-vaccinated patients. In general, for pharmaceutical compositions and vaccines comprising one or more polypeptides, the amount of each polypeptide present in a dose ranges from about 100 µg to 5 mg per kg of

host. Suitable dose sizes will vary with the size of the patient, but will typically range from about 0.1 mL to about 5 mL.

In general, an appropriate dosage and treatment regimen provides the active compound(s) in an amount sufficient to provide therapeutic and/or prophylactic benefit. Such a response can be monitored by establishing an improved clinical outcome (e.g., more frequent remissions, complete or partial, or longer disease-free survival) in treated patients as compared to non-treated patients. Increases in preexisting immune responses to a breast tumor protein generally correlate with an improved clinical outcome. Such immune responses may generally be evaluated using standard proliferation, cytotoxicity or cytokine assays, which may be performed using samples obtained from a patient before and after treatment.

METHODS FOR DETECTING CANCER

In general, a cancer may be detected in a patient based on the presence of one or more breast tumor proteins and/or polynucleotides encoding such proteins in a biological sample (for example, blood, sera, urine and/or tumor biopsies) obtained from the patient. In other words, such proteins may be used as markers to indicate the presence or absence of a cancer such as breast cancer. In addition, such proteins may be useful for the detection of other cancers. The binding agents provided herein generally permit detection of the level of antigen that binds to the agent in the biological sample. Polynucleotide primers and probes may be used to detect the level of mRNA encoding a tumor protein, which is also indicative of the presence or absence of a cancer. In general, a breast tumor sequence should be present at a level that is at least three fold higher in tumor tissue than in normal tissue

There are a variety of assay formats known to those of ordinary skill in the art for using a binding agent to detect polypeptide markers in a sample. See, e.g., Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. In general, the presence or absence of a cancer in a patient may be determined by (a) contacting a biological sample obtained from a patient with a binding agent; (b) detecting in the sample a level of polypeptide that binds to the binding agent; and (c) comparing the level of polypeptide with a predetermined cut-off value.

In a preferred embodiment, the assay involves the use of binding agent immobilized on a solid support to bind to and remove the polypeptide from the remainder of the sample. The bound polypeptide may then be detected using a detection reagent that contains a reporter group and specifically binds to the binding agent/polypeptide complex. Such detection reagents may comprise, for example, a binding agent that specifically binds to the polypeptide or an antibody or other agent that specifically binds to the binding agent, such as an anti-immunoglobulin, protein G, protein A or a lectin. Alternatively, a competitive assay may be utilized, in which a polypeptide is labeled with a reporter group and allowed to bind to the immobilized binding agent after incubation of the binding agent with the sample. The extent to which components of the sample inhibit the binding of the labeled polypeptide to the binding agent is indicative of the reactivity of the sample with the immobilized binding agent. Suitable polypeptides for use within such assays include full length breast tumor proteins and portions thereof to which the binding agent binds, as described above.

The solid support may be any material known to those of ordinary skill in the art to which the tumor protein may be attached. For example, the solid support may be a test well in a microtiter plate or a nitrocellulose or other suitable membrane. Alternatively, the support may be a bead or disc, such as glass, fiberglass, latex or a plastic material such as polystyrene or polyvinylchloride. The support may also be a magnetic particle or a fiber optic sensor, such as those disclosed, for example, in U.S. Patent No. 5,359,681. The binding agent may be immobilized on the solid support using a variety of techniques known to those of skill in the art, which are amply described in the patent and scientific literature. In the context of the present invention, the term "immobilization" refers to both noncovalent association, such as adsorption, and covalent attachment (which may be a direct linkage between the agent and functional groups on the support or may be a linkage by way of a cross-linking agent). Immobilization by adsorption to a well in a microtiter plate or to a membrane is preferred. In such cases, adsorption may be achieved by contacting the binding agent, in a suitable buffer, with the solid support for a suitable amount of time. The contact time varies with temperature, but is typically between about 1 hour and about 1 day. In general, contacting a well of a plastic microtiter plate (such as polystyrene or polyvinylchloride) with an amount of

binding agent ranging from about 10 ng to about 10 μ g, and preferably about 100 ng to about 1 μ g, is sufficient to immobilize an adequate amount of binding agent.

Covalent attachment of binding agent to a solid support may generally be achieved by first reacting the support with a bifunctional reagent that will react with both the support and a functional group, such as a hydroxyl or amino group, on the binding agent. For example, the binding agent may be covalently attached to supports having an appropriate polymer coating using benzoquinone or by condensation of an aldehyde group on the support with an amine and an active hydrogen on the binding partner (*see, e.g.,* Pierce Immunotechnology Catalog and Handbook, 1991, at A12-A13).

In certain embodiments, the assay is a two-antibody sandwich assay. This assay may be performed by first contacting an antibody that has been immobilized on a solid support, commonly the well of a microtiter plate, with the sample, such that polypeptides within the sample are allowed to bind to the immobilized antibody. Unbound sample is then removed from the immobilized polypeptide-antibody complexes and a detection reagent (preferably a second antibody capable of binding to a different site on the polypeptide) containing a reporter group is added. The amount of detection reagent that remains bound to the solid support is then determined using a method appropriate for the specific reporter group.

More specifically, once the antibody is immobilized on the support as described above, the remaining protein binding sites on the support are typically blocked. Any suitable blocking agent known to those of ordinary skill in the art, such as bovine serum albumin or Tween 20TM (Sigma Chemical Co., St. Louis, MO). The immobilized antibody is then incubated with the sample, and polypeptide is allowed to bind to the antibody. The sample may be diluted with a suitable diluent, such as phosphate-buffered saline (PBS) prior to incubation. In general, an appropriate contact time (*i.e.,* incubation time) is a period of time that is sufficient to detect the presence of polypeptide within a sample obtained from an individual with breast cancer. Preferably, the contact time is sufficient to achieve a level of binding that is at least about 95% of that achieved at equilibrium between bound and unbound polypeptide. Those of ordinary skill in the art will recognize that the time necessary to achieve equilibrium may be readily determined

by assaying the level of binding that occurs over a period of time. At room temperature, an incubation time of about 30 minutes is generally sufficient.

Unbound sample may then be removed by washing the solid support with an appropriate buffer, such as PBS containing 0.1% Tween 20™. The second antibody, which contains a reporter group, may then be added to the solid support. Preferred reporter groups include those groups recited above.

The detection reagent is then incubated with the immobilized antibody-polypeptide complex for an amount of time sufficient to detect the bound polypeptide. An appropriate amount of time may generally be determined by assaying the level of binding that occurs over a period of time. Unbound detection reagent is then removed and bound detection reagent is detected using the reporter group. The method employed for detecting the reporter group depends upon the nature of the reporter group. For radioactive groups, scintillation counting or autoradiographic methods are generally appropriate. Spectroscopic methods may be used to detect dyes, luminescent groups and fluorescent groups. Biotin may be detected using avidin, coupled to a different reporter group (commonly a radioactive or fluorescent group or an enzyme). Enzyme reporter groups may generally be detected by the addition of substrate (generally for a specific period of time), followed by spectroscopic or other analysis of the reaction products.

To determine the presence or absence of a cancer, such as breast cancer, the signal detected from the reporter group that remains bound to the solid support is generally compared to a signal that corresponds to a predetermined cut-off value. In one preferred embodiment, the cut-off value for the detection of a cancer is the average mean signal obtained when the immobilized antibody is incubated with samples from patients without the cancer. In general, a sample generating a signal that is three standard deviations above the predetermined cut-off value is considered positive for the cancer. In an alternate preferred embodiment, the cut-off value is determined using a Receiver Operator Curve, according to the method of Sackett et al., *Clinical Epidemiology: A Basic Science for Clinical Medicine*, Little Brown and Co., 1985, p. 106-7. Briefly, in this embodiment, the cut-off value may be determined from a plot of pairs of true positive rates (*i.e.*, sensitivity) and false positive rates (100%-specificity) that correspond

to each possible cut-off value for the diagnostic test result. The cut-off value on the plot that is the closest to the upper left-hand corner (*i.e.*, the value that encloses the largest area) is the most accurate cut-off value, and a sample generating a signal that is higher than the cut-off value determined by this method may be considered positive. Alternatively, the cut-off value may be shifted to the left along the plot, to minimize the false positive rate, or to the right, to minimize the false negative rate. In general, a sample generating a signal that is higher than the cut-off value determined by this method is considered positive for a cancer.

In a related embodiment, the assay is performed in a flow-through or strip test format, wherein the binding agent is immobilized on a membrane, such as nitrocellulose. In the flow-through test, polypeptides within the sample bind to the immobilized binding agent as the sample passes through the membrane. A second, labeled binding agent then binds to the binding agent-polypeptide complex as a solution containing the second binding agent flows through the membrane. The detection of bound second binding agent may then be performed as described above. In the strip test format, one end of the membrane to which binding agent is bound is immersed in a solution containing the sample. The sample migrates along the membrane through a region containing second binding agent and to the area of immobilized binding agent. Concentration of second binding agent at the area of immobilized antibody indicates the presence of a cancer. Typically, the concentration of second binding agent at that site generates a pattern, such as a line, that can be read visually. The absence of such a pattern indicates a negative result. In general, the amount of binding agent immobilized on the membrane is selected to generate a visually discernible pattern when the biological sample contains a level of polypeptide that would be sufficient to generate a positive signal in the two-antibody sandwich assay, in the format discussed above. Preferred binding agents for use in such assays are antibodies and antigen-binding fragments thereof. Preferably, the amount of antibody immobilized on the membrane ranges from about 25 ng to about 1 μ g, and more preferably from about 50 ng to about 500 ng. Such tests can typically be performed with a very small amount of biological sample.

Of course, numerous other assay protocols exist that are suitable for use with the tumor proteins or binding agents of the present invention. The above descriptions are intended to be exemplary only. For example, it will be apparent to those of ordinary skill in the art that the above protocols may be readily modified to use breast tumor polypeptides to detect antibodies that bind to such polypeptides in a biological sample. The detection of such breast tumor protein specific antibodies may correlate with the presence of a cancer.

A cancer may also, or alternatively, be detected based on the presence of T cells that specifically react with a breast tumor protein in a biological sample. Within certain methods, a biological sample comprising CD4⁺ and/or CD8⁺ T cells isolated from a patient is incubated with a breast tumor polypeptide, a polynucleotide encoding such a polypeptide and/or an APC that expresses at least an immunogenic portion of such a polypeptide, and the presence or absence of specific activation of the T cells is detected. Suitable biological samples include, but are not limited to, isolated T cells. For example, T cells may be isolated from a patient by routine techniques (such as by Ficoll/Hypaque density gradient centrifugation of peripheral blood lymphocytes). T cells may be incubated *in vitro* for 2-9 days (typically 4 days) at 37°C with polypeptide (*e.g.*, 5 - 25 µg/ml). It may be desirable to incubate another aliquot of a T cell sample in the absence of breast tumor polypeptide to serve as a control. For CD4⁺ T cells, activation is preferably detected by evaluating proliferation of the T cells. For CD8⁺ T cells, activation is preferably detected by evaluating cytolytic activity. A level of proliferation that is at least two fold greater and/or a level of cytolytic activity that is at least 20% greater than in disease-free patients indicates the presence of a cancer in the patient.

As noted above, a cancer may also, or alternatively, be detected based on the level of mRNA encoding a breast tumor protein in a biological sample. For example, at least two oligonucleotide primers may be employed in a polymerase chain reaction (PCR) based assay to amplify a portion of a breast tumor cDNA derived from a biological sample, wherein at least one of the oligonucleotide primers is specific for (*i.e.*, hybridizes to) a polynucleotide encoding the breast tumor protein. The amplified cDNA is then separated and detected using techniques well known in the art, such as gel electrophoresis. Similarly, oligonucleotide probes that specifically hybridize to a polynucleotide encoding a breast tumor protein may be used in a hybridization assay to detect the presence of polynucleotide encoding the tumor protein in a biological sample.

To permit hybridization under assay conditions, oligonucleotide primers and probes should comprise an oligonucleotide sequence that has at least about 60%, preferably at least about 75% and more preferably at least about 90%, identity to a portion of a polynucleotide encoding a breast tumor protein that is at least 10 nucleotides,

and preferably at least 20 nucleotides, in length. Preferably, oligonucleotide primers and/or probes will hybridize to a polynucleotide encoding a polypeptide disclosed herein under moderately stringent conditions, as defined above. Oligonucleotide primers and/or probes which may be usefully employed in the diagnostic methods described herein preferably are at least 10-40 nucleotides in length. In a preferred embodiment, the oligonucleotide primers comprise at least 10 contiguous nucleotides, more preferably at least 15 contiguous nucleotides, of a DNA molecule having a sequence recited in SEQ ID NOS:1-175, 178, 180 and 182-468. Techniques for both PCR based assays and hybridization assays are well known in the art (*see, for example, Mullis et al., Cold Spring Harbor Symp. Quant. Biol., 51:263, 1987; Erlich ed., PCR Technology, Stockton Press, NY, 1989*).

One preferred assay employs RT-PCR, in which PCR is applied in conjunction with reverse transcription. Typically, RNA is extracted from a biological sample, such as biopsy tissue, and is reverse transcribed to produce cDNA molecules. PCR amplification using at least one specific primer generates a cDNA molecule, which may be separated and visualized using, for example, gel electrophoresis. Amplification may be performed on biological samples taken from a test patient and from an individual who is not afflicted with a cancer. The amplification reaction may be performed on several dilutions of cDNA spanning two orders of magnitude. A two-fold or greater increase in expression in several dilutions of the test patient sample as compared to the same dilutions of the non-cancerous sample is typically considered positive.

In another embodiment, the disclosed compositions may be used as markers for the progression of cancer. In this embodiment, assays as described above for the diagnosis of a cancer may be performed over time, and the change in the level of reactive polypeptide(s) or polynucleotide evaluated. For example, the assays may be performed every 24-72 hours for a period of 6 months to 1 year, and thereafter performed as needed. In general, a cancer is progressing in those patients in whom the level of polypeptide or polynucleotide detected increases over time. In contrast, the cancer is not progressing when the level of reactive polypeptide or polynucleotide either remains constant or decreases with time.

Certain *in vivo* diagnostic assays may be performed directly on a tumor.

One such assay involves contacting tumor cells with a binding agent. The bound binding agent may then be detected directly or indirectly via a reporter group. Such binding agents may also be used in histological applications. Alternatively, polynucleotide probes may be used within such applications.

As noted above, to improve sensitivity, multiple breast tumor protein markers may be assayed within a given sample. It will be apparent that binding agents specific for different proteins provided herein may be combined within a single assay. Further, multiple primers or probes may be used concurrently. The selection of tumor protein markers may be based on routine experiments to determine combinations that results in optimal sensitivity. In addition, or alternatively, assays for tumor proteins provided herein may be combined with assays for other known tumor antigens.

DIAGNOSTIC KITS

The present invention further provides kits for use within any of the above diagnostic methods. Such kits typically comprise two or more components necessary for performing a diagnostic assay. Components may be compounds, reagents, containers and/or equipment. For example, one container within a kit may contain a monoclonal antibody or fragment thereof that specifically binds to a breast tumor protein. Such antibodies or fragments may be provided attached to a support material, as described above. One or more additional containers may enclose elements, such as reagents or buffers, to be used in the assay. Such kits may also, or alternatively, contain a detection reagent as described above that contains a reporter group suitable for direct or indirect detection of antibody binding.

Alternatively, a kit may be designed to detect the level of mRNA encoding a breast tumor protein in a biological sample. Such kits generally comprise at least one oligonucleotide probe or primer, as described above, that hybridizes to a polynucleotide encoding a breast tumor protein. Such an oligonucleotide may be used, for example, within a PCR or hybridization assay. Additional components that may be present within such kits include a second oligonucleotide and/or a diagnostic reagent or container to facilitate the detection of a polynucleotide encoding a breast tumor protein.

The following Examples are offered by way of illustration and not by way of limitation.

EXAMPLES

Example 1

ISOLATION AND CHARACTERIZATION OF BREAST TUMOR POLYPEPTIDES

This Example describes the isolation of breast tumor polypeptides from a breast tumor cDNA library.

A cDNA subtraction library containing cDNA from breast tumor subtracted with normal breast cDNA was constructed as follows. Total RNA was extracted from primary tissues using Trizol reagent (Gibco BRL Life Technologies, Gaithersburg, MD) as described by the manufacturer. The polyA⁺ RNA was purified using an oligo(dT) cellulose column according to standard protocols. First strand cDNA was synthesized using the primer supplied in a Clontech PCR-Select cDNA Subtraction Kit (Clontech, Palo Alto, CA). The driver DNA consisted of cDNAs from two normal breast tissues with the tester cDNA being from three primary breast tumors. Double-stranded cDNA was synthesized for both tester and driver, and digested with a combination of endonucleases (MluI, MscI, PvuII, SalI and StuI) which recognize six base pairs DNA. This modification increased the average cDNA size dramatically compared with cDNAs generated according to the protocol of Clontech (Palo Alto, CA). The digested tester cDNAs were ligated to two different adaptors and the subtraction was performed according to Clontech's protocol. The subtracted cDNAs were subjected to two rounds of PCR amplification, following the manufacturer's protocol. The resulting PCR products were subcloned into the TA cloning vector, pCRII (Invitrogen, San Diego, CA) and transformed into ElectroMax *E. coli* DH10B cells (Gibco BRL Life, Technologies) by electroporation. DNA was isolated from independent clones and sequenced using a Perkin Elmer/Applied Biosystems Division (Foster City, CA) Automated Sequencer Model 373A.

Sixty-three distinct cDNA clones were found in the subtracted breast tumor-specific cDNA library. The determined one strand (5' or 3') cDNA sequences for the clones are provided in SEQ ID NO: 1-61, 72 and 73, respectively. Comparison of these cDNA sequences with known sequences in the gene bank using the EMBL and GenBank databases (Release 97) revealed no significant homologies to the sequences provided in SEQ ID NO: 14, 21, 22, 27, 29, 30, 32, 38, 44, 45, 53, 72 and 73. The sequences of SEQ ID NO: 1, 3, 16, 17, 34, 48, 57, 60 and 61 were found to represent known human genes. The sequences of SEQ ID NO: 2, 4, 23, 39 and 50 were found to show some similarity to previously identified non-human genes. The remaining clones (SEQ ID NO: 5-13, 15, 18-20, 24-26, 28, 31, 33, 35-37, 40-43, 46, 47, 49, 51, 52, 54-56, 58 and 59) were found to show at least some degree of homology to previously identified expressed sequence tags (ESTs).

To determine mRNA expression levels of the isolated cDNA clones, cDNA clones from the breast subtraction described above were randomly picked and colony PCR amplified. Their mRNA expression levels in breast tumor, normal breast and various other normal tissues were determined using microarray technology (Synteni, Palo Alto, CA). Briefly, the PCR amplification products were arrayed onto slides in an array format, with each product occupying a unique location in the array. mRNA was extracted from the tissue sample to be tested, reverse transcribed, and fluorescent-labeled cDNA probes were generated. The microarrays were probed with the labeled cDNA probes, the slides scanned and fluorescence intensity was measured. Data was analyzed using Synteni provided GEMTOOLS Software. Of the seventeen cDNA clones examined, those of SEQ ID NO: 40, 46, 59 and 73 were found to be over-expressed in breast tumor and expressed at low levels in all normal tissues tested (breast, PBMC, colon, fetal tissue, salivary gland, bone marrow, lung, pancreas, large intestine, spinal cord, adrenal gland, kidney, pancreas, liver, stomach, skeletal muscle, heart, small intestine, skin, brain and human mammary epithelial cells). The clones of SEQ ID NO: 41 and 48 were found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested, with the exception of bone marrow. The clone of SEQ ID NO: 42 was found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested except bone marrow and spinal cord. The clone of SEQ ID NO: 43 was

found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested with the exception of spinal cord, heart and small intestine. The clone of SEQ ID NO: 51 was found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested with the exception of large intestine. The clone of SEQ ID NO: 54 was found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested with the exception of PBMC, stomach and small intestine. The clone of SEQ ID NO: 56 was found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested with the exception of large and small intestine, human mammary epithelia cells and SCID mouse-passaged breast tumor. The clone of SEQ ID NO: 60 was found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested with the exception of spinal cord and heart. The clone of SEQ ID NO: 61 was found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested with the exception of small intestine. The clone of SEQ ID NO: 72 was found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested with the exception of colon and salivary gland.

The results of a Northern blot analysis of the clone SYN18C6 (SEQ ID NO: 40) are shown in Fig. 1. A predicted protein sequence encoded by SYN18C6 is provided in SEQ ID NO: 62.

Additional cDNA clones that are over-expressed in breast tumor tissue were isolated from breast cDNA subtraction libraries as follows. Breast subtraction libraries were prepared, as described above, by PCR-based subtraction employing pools of breast tumor cDNA as the tester and pools of either normal breast cDNA or cDNA from other normal tissues as the driver. cDNA clones from breast subtraction were randomly picked and colony PCR amplified and their mRNA expression levels in breast tumor, normal breast and various other normal tissues were determined using the microarray technology described above. Twenty-four distinct cDNA clones were found to be over-expressed in breast tumor and expressed at low levels in all normal tissues tested (breast, brain, liver, pancreas, lung, salivary gland, stomach, colon, kidney, bone marrow, skeletal muscle, PBMC, heart, small intestine, adrenal gland, spinal cord, large intestine and skin). The determined partial cDNA sequences for these clones are provided in SEQ ID NO: 63-87. Comparison of the sequences of SEQ ID NO: 74-87

with those in the gene bank as described above, revealed homology to previously identified human genes. No significant homologies were found to the sequences of SEQ ID NO: 63-73.

Three DNA isoforms for the clone B726P (partial sequence provided in SEQ ID NO: 71) were isolated as follows. A radioactive probe was synthesized from B726P by excising B726P DNA from a pT7Blue vector (Novagen) by a BamHI/XbaI restriction digest and using the resulting DNA as the template in a single-stranded PCR in the presence of [α -³²P]dCTP. The sequence of the primer employed for this PCR is provided in SEQ ID NO: 177. The resulting radioactive probe was used to probe a directional cDNA library and a random-primed cDNA library made using RNA isolated from breast tumors. Eighty-five clones were identified, excised, purified and sequenced. Of these 85 clones, three were found to each contain a significant open reading frame. The determined cDNA sequence of the isoform B726P-20 is provided in SEQ ID NO: 175, with the corresponding predicted amino acid sequence being provided in SEQ ID NO: 176. The determined cDNA sequence of the isoform B726P-74 is provided in SEQ ID NO: 178, with the corresponding predicted amino acid sequence being provided in SEQ ID NO: 179. The determined cDNA sequence of the isoform B726P-79 is provided in SEQ ID NO: 180, with the corresponding predicted amino acid sequence being provided in SEQ ID NO: 181.

Efforts to obtain a full-length clone of B726P using standard techniques led to the isolation of five additional clones that represent additional 5' sequence of B726P. These clones appear to be alternative splice forms of the same gene. The determined cDNA sequences of these clones are provided in SEQ ID NO: 464-468, with the predicted amino acid sequences encoded by SEQ ID NO: 464-467 being provided in SEQ ID NO: 470-473, respectively. Using standard computer techniques, a 3,681 bp consensus DNA sequence (SEQ ID NO: 463) was created that contains two large open reading frames. The downstream ORF encodes the predicted amino acid sequence of SEQ ID NO: 181. The predicted amino acid sequence encoded by the upstream ORF is provided in SEQ ID NO: 469.

Further isolation of individual clones that are over-expressed in breast tumor tissue was conducted using cDNA subtraction library techniques described above. In particular, a cDNA subtraction library containing cDNA from breast tumors subtracted with five other normal human tissue cDNAs (brain, liver, PBMC, pancreas and normal breast) was utilized in this screening. From the original subtraction, one hundred seventy seven clones were selected to be further characterized by DNA sequencing and microarray analysis. Microarray analysis demonstrated that the sequences in SEQ ID NO: 182-251 were 2 or more fold over-expressed in human breast tumor tissues over normal human tissues. No significant homologies were found for nineteen of these clones, including, SEQ ID NO: 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245 and 246, with the exception of some previously identified expressed sequence tags (ESTs). The remaining clones share some homology to previously identified genes, specifically SEQ ID NO: 181-184, 187-193, 195-198, 200-204, 206, 207, 209, 210, 212, 213, 217, 218, 220, 221, 223-225, 227-231, 233-235, 237-239, 242-244 and 247-251.

Of the seventy clones showing over-expression in breast tumor tissues, fifteen demonstrated particularly good expression levels in breast tumor over normal human tissues. The following eleven clones did not show any significant homology to any known genes. Clone 19463.1 (SEQ ID NO: 185) was over-expressed in the majority of breast tumors and also in the SCID breast tumors tested (refer to Example 2); additionally, over-expression was found in a majority of normal breast tissues. Clone 19483.1 (SEQ ID NO: 216) was over-expressed in a few breast tumors, with no over-expression in any normal tissues tested. Clone 19470.1 (SEQ ID NO: 219) was found to be slightly over-expressed in some breast tumors. Clone 19468.1 (SEQ ID NO: 222) was found to be slightly over-expressed in the majority of breast tumors tested. Clone 19505.1 (SEQ ID NO: 226) was found to be slightly over-expressed in 50% of breast tumors, as well as in SCID tumor tissues, with some degree of over-expression in found in normal breast. Clone 1509.1 (SEQ ID NO: 232) was found to be over-expressed in very few breast tumors, but with a certain degree of over-expression in metastatic breast tumor tissues, as well as no significant over-expression found in normal tissues. Clone 19513.1 (SEQ ID NO: 236) was shown to be slightly over-expressed in few breast

tumors, with no significant over-expression levels found in normal tissues. Clone 19575.1 (SEQ ID NO: 240) showed low level over-expression in some breast tumors and also in normal breast. Clone 19560.1 (SEQ ID NO: 241) was over-expressed in 50% of breast tumors tested, as well as in some normal breast tissues. Clone 19583.1 (SEQ ID NO: 245) was slightly over-expressed in some breast tumors, with very low levels of over-expression found in normal tissues. Clone 19587.1 (SEQ ID NO: 246) showed low level over-expression in some breast tumors and no significant over-expression in normal tissues.

Clone 19520.1 (SEQ ID NO: 233), showing homology to clone 102D24 on chromosome 11q13.31, was found to be over-expressed in breast tumors and in SCID tumors. Clone 19517.1 (SEQ ID NO: 237), showing homology to human PAC 128M19 clone, was found to be slightly over-expressed in the majority of breast tumors tested. Clone 19392.2 (SEQ ID NO: 247), showing homology to human chromosome 17, was shown to be over-expressed in 50% of breast tumors tested. Clone 19399.2 (SEQ ID NO: 250), showing homology to human Xp22 BAC GSHB-184P14, was shown to be slightly over-expressed in a limited number of breast tumors tested.

In subsequent studies, 64 individual clones were isolated from a subtracted cDNA library containing cDNA from a pool of breast tumors subtracted with cDNA from five normal tissues (brain, liver, PBMC, pancreas and normal breast). The subtracted cDNA library was prepared as described above with the following modification. A combination of five six-base cutters (MluI, MscI, PvuII, SalI and StuI) was used to digest the cDNA instead of RsaI. This resulted in an increase in the average insert size from 300 bp to 600 bp. The 64 isolated clones were colony PCR amplified and their mRNA expression levels in breast tumor tissue, normal breast and various other normal tissues were examined by microarray technology as described above. The determined cDNA sequences of 11 clones which were found to be over-expressed in breast tumor tissue are provided in SEQ ID NO: 405-415. Comparison of these sequences to those in the public database, as outlined above, revealed homologies between the sequences of SEQ ID NO: 408, 411, 413 and 414 and previously isolated ESTs. The sequences of SEQ ID NO: 405-407, 409, 410, 412 and 415 were found to show some homology to previously identified sequences.

In further studies, a subtracted cDNA library was prepared from cDNA from metastatic breast tumors subtracted with a pool of cDNA from five normal tissues (breast, brain, lung, pancreas and PBMC) using the PCR-subtraction protocol of Clontech, described above. The determined cDNA sequences of 90 clones isolated from this library are provided in SEQ ID NO: 315-404. Comparison of these sequences with those in the public database, as described above, revealed no significant homologies to the sequence of SEQ ID NO: 366. The sequences of SEQ ID NO: 320-324, 342, 353, 367, 368, 377, 382, 385, 389, 395, 397 and 400 were found to show some homology to previously isolated ESTs. The remaining sequences were found to show homology to previously identified gene sequences.

In yet further studies, a subtracted cDNA library (referred to as 2BT) was prepared from cDNA from breast tumors subtracted with a pool of cDNA from six normal tissues (liver, brain, stomach, small intestine, kidney and heart) using the PCR-subtraction protocol of Clontech, described above. cDNA clones isolated from this subtraction were subjected to DNA microarray analysis as described above and the resulting data subjected to four modified Gemtools analyses. The first analysis compared 28 breast tumors with 28 non-breast normal tissues. A mean over-expression of at least 2.1 fold was used as a selection cut-off. The second analysis compared 6 metastatic breast tumors with 29 non-breast normal tissues. A mean over-expression of at least 2.5 fold was used as a cut-off. The third and fourth analyses compared 2 early SCID mouse-passaged with 2 late SCID mouse-passaged tumors. A mean over-expression in the early or late passaged tumors of 2.0 fold or greater was used as a cut-off. In addition, a visual analysis was performed on the microarray data for the 2BT clones. The determined cDNA sequences of 13 clones identified in the visual analysis are provided in SEQ ID NO: 427-439. The determined cDNA sequences of 22 clones identified using the modified Gemtools analysis are provided in SEQ ID NO: 440-462, wherein SEQ ID NO: 453 and 454 represent two partial, non-overlapping, sequences of the same clone.

Comparison of the clone sequences of SEQ ID NO: 436 and 437 (referred to as 263G6 and 262B2) with those in the public databases, as described above, revealed no significant homologies to previously identified sequences. The sequences of SEQ ID NO: 427, 429, 431, 435, 438, 441, 443, 444, 445, 446, 450, 453 and 454 (referred to as

266B4, 266G3, 264B4, 263G1, 262B6, 2BT2-34, 2BT1-77, 2BT1-62, 2BT1-60,61, 2BT1-59, 2BT1-52 and 2BT1-40, respectively) showed some homology to previously isolated expressed sequences tags (ESTs). The sequences of SEQ ID NO: 428, 430, 432, 433, 434, 439, 440, 442, 447, 448, 449, 451, 452 and 455-462 (referred to as clones 22892, 22890, 22883, 22882, 22880, 22869, 21374, 21349, 21093, 21091, 21089, 21085, 21084, 21063, 21062, 21060, 21053, 21050, 21036, 21037 and 21048, respectively), showed some homology to gene sequences previously identified in humans.

Example 2

ISOLATION AND CHARACTERIZATION OF BREAST TUMOR POLYPEPTIDES OBTAINED BY PCR-BASED SUBTRACTION USING SCID-PASSAGED TUMOR RNA

Human breast tumor antigens were obtained by PCR-based subtraction using SCID mouse passaged breast tumor RNA as follows. Human breast tumor was implanted in SCID mice and harvested on the first or sixth serial passage, as described in Patent Application Serial No. 08/556,659 filed 11/13/95, U.S. Patent No. _____. Genes found to be differentially expressed between early and late passage SCID tumor may be stage specific and therefore useful in therapeutic and diagnostic applications. Total RNA was prepared from snap frozen SCID passaged human breast tumor from both the first and sixth passage.

PCR-based subtraction was performed essentially as described above. In the first subtraction (referred to as T9), RNA from first passage tumor was subtracted from sixth passage tumor RNA to identify more aggressive, later passage-specific antigens. Of the 64 clones isolated and sequenced from this subtraction, no significant homologies were found to 30 of these clones, hereinafter referred to as: 13053, 13057, 13059, 13065, 13067, 13068, 13071-13073, 13075, 13078, 13079, 13081, 13082, 13092, 13097, 13101, 13102, 13131, 13133, 13119, 13135, 13139, 13140, 13146-13149, and 13151, with the exception of some previously identified expressed sequence tags (ESTs). The determined cDNA sequences for these clones are provided in SEQ ID NO: 88-116,

respectively. The isolated cDNA sequences of SEQ ID NO: 117-140 showed homology to known genes.

In a second PCR-based subtraction, RNA from sixth passage tumor was subtracted from first passage tumor RNA to identify antigens down-regulated over multiple passages. Of the 36 clones isolated and sequenced, no significant homologies were found to nineteen of these clones, hereinafter referred to as: 14376, 14377, 14383, 14384, 14387, 14392, 14394, 14398, 14401, 14402, 14405, 14409, 14412, 14414-14416, 14419, 14426, and 14427, with the exception of some previously identified expressed sequence tags (ESTs). The determined cDNA sequences for these clones are provided in SEQ ID NO: 141-159, respectively. The isolated cDNA sequences of SEQ ID NO: 160-174 were found to show homology to previously known genes.

Further analysis of human breast tumor antigens through PCR-based subtraction using first and sixth passage SCID tumor RNA was performed. Sixty three clones were found to be differentially expressed by a two or more fold margin, as determined by microarray analysis, i.e., higher expression in early passage tumor over late passage tumor, or vice versa.. Seventeen of these clones showed no significant homology to any known genes, although some degree of homology with previously identified expressed sequence tags (ESTs) was found, hereinafter referred to as 20266, 20270, 20274, 20276, 20277, 20280, 20281, 20294, 20303, 20310, 20336, 20341, 20941, 20954, 20961, 20965 and 20975 (SEQ ID NO: 252-268, respectively). The remaining clones were found to share some degree of homology to known genes, which are identified in the Brief Description of the Drawings and Sequence Identifiers section above, hereinafter referred to as 20261, 20262, 20265, 20267, 20268, 20271, 20272, 20273, 20278, 20279, 20293, 20300, 20305, 20306, 20307, 20313, 20317, 20318, 20320, 20321, 20322, 20326, 20333, 20335, 20337, 20338, 20340, 20938, 20939, 20940, 20942, 20943, 20944, 20946, 20947, 20948, 20949, 20950, 20951, 20952, 20957, 20959, 20966, 20976, 20977 and 20978. The determined cDNA sequences for these clones are provided in SEQ ID NO: 269-313, respectively.

The clones 20310, 20281, 20262, 20280, 20303, 20336, 20270, 20341, 20326 and 20977 (also referred to as B820P, B821P, B822P, B823P, B824P, B825P, B826P, B827P, B828P and B829P, respectively) were selected for further analysis based

on the results obtained with microarray analysis. Specifically, microarray data analysis indicated at least two- to three-fold overexpression of these clones in breast tumor RNA compared to normal tissues tested. Subsequent studies led to the determination of the complete insert sequence for the clones B820P, B821P, B822P, B823P, B824P, B825P, B826P, B827P, B828P and B829P. These extended cDNA sequences are provided in SEQ ID NO: 416-426, respectively.

Example 3

SYNTHESIS OF POLYPEPTIDES

Polypeptides may be synthesized on an Perkin Elmer/Applied Biosystems Division 430A peptide synthesizer using Fmoc chemistry with HPTU (O-Benzotriazole-N,N,N',N'-tetramethyluronium hexafluorophosphate) activation. A Gly-Cys-Gly sequence may be attached to the amino terminus of the peptide to provide a method of conjugation, binding to an immobilized surface, or labeling of the peptide. Cleavage of the peptides from the solid support may be carried out using the following cleavage mixture: trifluoroacetic acid:ethanedithiol:thioanisole:water:phenol (40:1:2:2:3). After cleaving for 2 hours, the peptides may be precipitated in cold methyl-t-butyl-ether. The peptide pellets may then be dissolved in water containing 0.1% trifluoroacetic acid (TFA) and lyophilized prior to purification by C18 reverse phase HPLC. A gradient of 0%-60% acetonitrile (containing 0.1% TFA) in water (containing 0.1% TFA) may be used to elute the peptides. Following lyophilization of the pure fractions, the peptides may be characterized using electrospray or other types of mass spectrometry and by amino acid analysis.

From the foregoing, it will be appreciated that, although specific embodiments of the invention have been described herein for the purposes of illustration, various modifications may be made without deviating from the spirit and scope of the invention.

Claims

1. An isolated polypeptide comprising at least an immunogenic portion of a breast tumor protein, or a variant thereof, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(a) sequences recited in SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468;

(b) sequences that hybridize to a sequence of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468 under moderately stringent conditions; and

(c) a complement of a sequence of (a) or (b).

2. An isolated polypeptide according to claim 1, wherein the polypeptide comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468 or a complement of any of the foregoing polynucleotide sequences.

3. An isolated polypeptide comprising a sequence recited in any one of SEQ ID NO: 176, 179, 181 and 469-473.

4. An isolated polynucleotide encoding at least 15 contiguous amino acid residues of a breast tumor protein, or a variant thereof that differs in one or more substitutions, deletions, additions and/or insertions such that the ability of the variant to react with antigen-specific antisera is not substantially diminished, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide comprising a sequence recited in any one of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468 or a complement of any of the foregoing sequences.

5. An isolated polynucleotide encoding a breast tumor protein, or a variant thereof, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide comprising a sequence recited in any one of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468 or a complement of any of the foregoing sequences.

6. An isolated polynucleotide comprising a sequence recited in any one of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468.

7. An isolated polynucleotide comprising a sequence that hybridizes to a sequence recited in any one of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219,

222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468 under moderately stringent conditions.

8. An isolated polynucleotide complementary to a polynucleotide according to any one of claims 4-7.

9. An expression vector comprising a polynucleotide according to any one of claims claim 4-7.

10. A host cell transformed or transfected with an expression vector according to claim 9.

11. An expression vector comprising a polynucleotide according claim 8.

12. A host cell transformed or transfected with an expression vector according to claim 11.

13. A pharmaceutical composition comprising a polypeptide according to claim 1, in combination with a physiologically acceptable carrier.

14. A vaccine comprising a polypeptide according to claim 1, in combination with an immunostimulant.

15. A vaccine according to claim 14, wherein the immunostimulant is an adjuvant.

16. A vaccine according to claim 14, wherein the immunostimulant induces a predominantly Type I response.

17. A pharmaceutical composition comprising a polynucleotide according to claim 4, in combination with a physiologically acceptable carrier.
18. A vaccine comprising a polynucleotide according to claim 4. in combination with an immunostimulant.
19. A vaccine according to claim 18, wherein the immunostimulant is an adjuvant.
20. A vaccine according to claim 18, wherein the immunostimulant induces a predominantly Type I response.
21. An isolated antibody, or antigen-binding fragment thereof, that specifically binds to a breast tumor protein that comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468 or a complement of any of the foregoing polynucleotide sequences.
22. A pharmaceutical composition comprising an antibody or fragment thereof according to claim 18, in combination with a physiologically acceptable carrier.

23. A pharmaceutical composition comprising an antigen-presenting cell that expresses a polypeptide according to claim 1, in combination with a pharmaceutically acceptable carrier or excipient.

24. A pharmaceutical composition according to claim 23, wherein the antigen presenting cell is a dendritic cell or a macrophage.

25. A vaccine comprising an antigen-presenting cell that expresses a polypeptide according to claim 1, in combination with an immunostimulant.

26. A vaccine according to claim 25, wherein the immunostimulant is an adjuvant.

27. A vaccine according to claim 25, wherein the immunostimulant induces a predominantly Type I response.

28. A vaccine according to claim 25, wherein the antigen-presenting cell is a dendritic cell.

29. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a polypeptide according to claim 1, and thereby inhibiting the development of a cancer in the patient.

30. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a polynucleotide according to claim 4, and thereby inhibiting the development of a cancer in the patient.

31. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of an antibody or antigen-binding fragment thereof according to claim 21, and thereby inhibiting the development

of a cancer in the patient.

32. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of an antigen-presenting cell that expresses a polypeptide according to claim 1, and thereby inhibiting the development of a cancer in the patient.

33. A method according to claim 32, wherein the antigen-presenting cell is a dendritic cell.

34. A method according to any one of claims 29-32, wherein the cancer is breast cancer .

35. A fusion protein comprising at least one polypeptide according to claim 1.

36. A fusion protein according to claim 35, wherein the fusion protein comprises an expression enhancer that increases expression of the fusion protein in a host cell transfected with a polynucleotide encoding the fusion protein.

37. A fusion protein according to claim 35, wherein the fusion protein comprises a T helper epitope that is not present within the polypeptide of claim 1.

38. A fusion protein according to claim 35, wherein the fusion protein comprises an affinity tag.

39. An isolated polynucleotide encoding a fusion protein according to claim 35.

40. A pharmaceutical composition comprising a fusion protein according to claim 32, in combination with a physiologically acceptable carrier.

41. A vaccine comprising a fusion protein according to claim 35, in combination with an immunostimulant.

42. A vaccine according to claim 41, wherein the immunostimulant is an adjuvant.

43. A vaccine according to claim 41, wherein the immunostimulant induces a predominantly Type I response.

44. A pharmaceutical composition comprising a polynucleotide according to claim 40, in combination with a physiologically acceptable carrier.

45. A vaccine comprising a polynucleotide according to claim 40, in combination with an immunostimulant.

46. A vaccine according to claim 45, wherein the immunostimulant is an adjuvant.

47. A vaccine according to claim 45, wherein the immunostimulant induces a predominantly Type I response.

48. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a pharmaceutical composition according to claim 40 or claim 44.

49. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a vaccine according to claim 41 or claim 45.

50. A method for removing tumor cells from a biological sample, comprising contacting a biological sample with T cells that specifically react with a breast tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) polynucleotides recited in any one of SEQ ID NOS: 1-175, 178, 180 and 182-468; and

(ii) complements of the foregoing polynucleotides;

wherein the step of contacting is performed under conditions and for a time sufficient to permit the removal of cells expressing the antigen from the sample.

51. A method according to claim 50, wherein the biological sample is blood or a fraction thereof.

52. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient a biological sample treated according to the method of claim 50.

53. A method for stimulating and/or expanding T cells specific for a breast tumor protein, comprising contacting T cells with one or more of:

(i) a polypeptide according to claim 1;

(ii) a polynucleotide encoding such a polypeptide; and/or

(iii) an antigen presenting cell that expresses such a polypeptide;

under conditions and for a time sufficient to permit the stimulation and/or expansion of T cells.

54. An isolated T cell population, comprising T cells prepared according to the method of claim 53.

55. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a T cell population according to claim 54.

56. A method for inhibiting the development of a cancer in a patient, comprising the steps of:

(a) incubating CD4⁺ and/or CD8⁺ T cells isolated from a patient with at least one component selected from the group consisting of:

- (i) a polypeptide according to claim 1;
- (ii) a polynucleotide encoding such a polypeptide; or
- (iii) an antigen-presenting cell that expresses such a polypeptide;

such that T cells proliferate; and

(b) administering to the patient an effective amount of the proliferated T cells, and thereby inhibiting the development of a cancer in the patient.

57. A method for inhibiting the development of a cancer in a patient, comprising the steps of:

(a) incubating CD4⁺ and/or CD8⁺ T cells isolated from a patient with at least one component selected from the group consisting of:

- (i) a polypeptide according to claim 1;
- (ii) a polynucleotide encoding such a polypeptide; or
- (iii) an antigen-presenting cell that expresses such a polypeptide;

such that T cells proliferate;

(b) cloning at least one proliferated cell; and

(c) administering to the patient an effective amount of the cloned T cells, and thereby inhibiting the development of a cancer in the patient.

58. A method for determining the presence or absence of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient with a binding agent that binds to a breast tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) polynucleotides recited in any one of SEQ ID NOS: 1-175, 178, 180 and 182-468; and

(ii) complements of the foregoing polynucleotides;

(b) detecting in the sample an amount of polypeptide that binds to the binding agent; and

(c) comparing the amount of polypeptide to a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient.

59. A method according to claim 58, wherein the binding agent is an antibody.

60. A method according to claim 59, wherein the antibody is a monoclonal antibody.

61. A method according to claim 58, wherein the cancer is breast cancer.

62. A method for monitoring the progression of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient at a first point in time with a binding agent that binds to a breast tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOS: 1-175, 178, 180 and 182-468 or a complement of any of the foregoing polynucleotides;

(b) detecting in the sample an amount of polypeptide that binds to the binding agent;

(c) repeating steps (a) and (b) using a biological sample obtained from

the patient at a subsequent point in time; and

(d) comparing the amount of polypeptide detected in step (c) to the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

63. A method according to claim 62, wherein the binding agent is an antibody.

64. A method according to claim 63, wherein the antibody is a monoclonal antibody.

65. A method according to claim 62, wherein the cancer is a breast cancer.

66. A method for determining the presence or absence of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a breast tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOS: 1-175, 178, 180 and 182-468 or a complement of any of the foregoing polynucleotides;

(b) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide; and

(c) comparing the amount of polynucleotide that hybridizes to the oligonucleotide to a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient.

67. A method according to claim 66, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a polymerase chain reaction.

68. A method according to claim 66, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a hybridization assay.

69. A method for monitoring the progression of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a breast tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOS: 1-175, 178, 180 and 182-468 or a complement of any of the foregoing polynucleotides;

(b) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide;

(c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and

(d) comparing the amount of polynucleotide detected in step (c) to the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

70. A method according to claim 69, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a polymerase chain reaction.

71. A method according to claim 69, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a hybridization assay.

72. A diagnostic kit, comprising:

- (a) one or more antibodies according to claim 21; and
- (b) a detection reagent comprising a reporter group.

73. A kit according to claim 72, wherein the antibodies are immobilized on a solid support.

74. A kit according to claim 73, wherein the solid support comprises nitrocellulose, latex or a plastic material.

75. A kit according to claim 72, wherein the detection reagent comprises an anti-immunoglobulin, protein G, protein A or lectin.

76. A kit according to claim 72, wherein the reporter group is selected from the group consisting of radioisotopes, fluorescent groups, luminescent groups, enzymes, biotin and dye particles.

77. An oligonucleotide comprising 10 to 40 contiguous nucleotides that hybridize under moderately stringent conditions to a polynucleotide that encodes a breast tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468 or a complement of any of the foregoing polynucleotides.

78. A oligonucleotide according to claim 77, wherein the oligonucleotide comprises 10-40 contiguous nucleotides recited in any one of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468.

79. A diagnostic kit, comprising:

- (a) an oligonucleotide according to claim 77; and
- (b) a diagnostic reagent for use in a polymerase chain reaction or hybridization assay.

SEQUENCE LISTING

<110> Corixa Corporation
 Yuqui, Jiang
 Dillon, Davin C.
 Mitcham, Jennifer L.
 Xu, Jiangchun
 Harlocker, Susan L.

<120> COMPOSITIONS FOR THE TREATMENT AND
 DIAGNOSIS OF BREAST CANCER AND METHODS FOR THEIR USE

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tgaatatattg	agggataaaa	attgtgtaag	aagccaaaga	aattggtagt	aggggggaga	300
ac						302

<210> 26

<211> 301

<212> DNA

<213> Homo sapien

<400> 26

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agaactgcac	tggcctctcc	tgctgcctga	tttatctgtg	cagccttttc	tgcttcggag	180
gccaggatct	gggcctgttt	cttcccttct	gccacattga	tggccgactc	tcgggtcccc	240
tcagactcta	gaactgtggc	ccgtttccgc	cgctctgcct	ccacctgcat	ctgcatagac	300
t						301

<210> 27

<211> 301

<212> DNA

<213> Homo sapien

<400> 27

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accattttat	tagacaccct	ctattagtgt	taacagacaa	agatgaaggt	taagttgaaa	120
tcaaattgaa	atcatcttcc	ctctgtacag	attgcaatat	ctgataatac	cctcaacttt	180
cttggtgcaa	attaatggcc	tggtactcac	agtccagtg	taacaggcaa	taatggtgtg	240
attccagagg	agaggactag	gtggcaggaa	aataaatgag	attagcagta	tttgacttgg	300
a						301

<210> 28

<211> 286

<212> DNA

<213> Homo sapien

<400> 28

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atccttagag	gaagagaggg	gtaaggatgat	aaagtaactg	aaggaccgca	agacgggtat	120
gtcccttggt	caccaaattg	tcaaaggggc	aaagatcgga	ggaggtcagg	gggtaacgca	180
ggaacagggtg	agggcggttc	gcctctcttc	cctctccctc	tttcaacctc	ttaatcactg	240
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<210> 29

<211> 301

<212> DNA

<213> Homo sapien

<400> 29

gtcatgttct	tgctcttcct	tctttacaca	tttgagttgt	gccttctgtt	cttaaagaga	60
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ttttcccttg ttcaaaggat ttattcctac catttcacaa atccgaaaat aattgaggaa 120
acagggtaca tcattccaat tttgccttgg gtttgaagag tctctcatgg tggcacagtc 180
ctccagggtg gctatgttgt tgggctcccc tacatcccag aagctcagag actttgtcaa 240
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a 301

<210> 30
<211> 332
<212> DNA
<213> Homo sapien

<400> 30
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cacctagctc tctcctctgg aatcacacca ttattgcctg ttaacactgg actgtgagta 120
ccaggcaatt aatttgcacc aagaaagtgt aggggtattat cagatattgc aatctgtaca 180
gaggggaagat gatttcaatt tgatttcaac ttaaccttca tctttgtctg ttaacactaa 240
tagaggggtgt ctaataaaaat ggtcaaattt gtgatctcat ttgttataac tagcactctt 300
ttcacagatg tgatgactga tttccagcag ac 332

<210> 31
<211> 141
<212> DNA
<213> Homo sapien

<400> 31
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tttcatttgc aggggttcag ggaggggtgc aggggttcag ggagggctct tgtcccacaa 120
ccgggggaag ggagagggca c 141

<210> 32
<211> 201
<212> DNA
<213> Homo sapien

<400> 32
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catccaccta cataaccaac atagatgtga ggtccactgc actgatagcc agactgcctg 180
gggtaaacct tttcagggag g 201

<210> 33
<211> 181
<212> DNA
<213> Homo sapien

<400> 33
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gactaaactt caagtcacag acttttatgt gacagattgg agcaggggtt gttatgcatg 120
tagagaaccc aaactaattt attaaacagg atagaaacag gctgtctggg tgaaatggtt 180
c 181

<210> 34
<211> 151
<212> DNA
<213> Homo sapien

<400> 34
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 acttttcagt cgagggcctg atgaatcttg g 151

<210> 35
 <211> 291
 <212> DNA
 <213> Homo sapien

<400> 35
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 ttccagtttg tttttcacct ataatagaatt gtaaaaaaaa acatacttgt ggggtctgat 180
 agcaaacata gaaatgatgt atattgtttt ttgttatcta tttattttca tcaatacagt 240
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<210> 36
 <211> 201
 <212> DNA
 <213> Homo sapien

<400> 36
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 gtgaacaca caagccaatc cggaactgct gtgcgaaaga taaaatcgag aaaggcaagg 180
 tttcggtagg aggacgcgat g 201

<210> 37
 <211> 121
 <212> DNA
 <213> Homo sapien

<400> 37
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 c 121

<210> 38
 <211> 200
 <212> DNA
 <213> Homo sapien

<400> 38
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 gataacacca cacatagaac attataatta cacacaaatt tatggtaaaa gaattaatat 180
 gctgtctggt gctgctgtta 200

<210> 39
 <211> 760
 <212> DNA
 <213> Homo sapien

<400> 39

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ttttaacagt	gatcaaatta	ttatttcgaa	gttaatcgtt	cccttgggtg	ctgcatacac	180
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gtcatcccca	gggtctatac	atactatgtt	tcaactgtat	tatttgccat	ttttggcatt	300
agaatgcttc	gggaaggctt	aaagatgagc	cctgatgagg	gtcaagagga	actggaagaa	360
gttcaagctg	aattaaaagaa	gaaagatgaa	gaagtaagcc	atggcactgt	tgatctggac	420
caaaaaggca	ctcaactagg	aataaacact	ctacagaggt	ttctcagtg	ccccatctgt	480
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tgaacacagg	taatcagttt	ccttaattag	gttgattata	agctcctgaa	aagcaggaac	660
tgtattttat	aattttacct	gtttctccc	tggtgtctag	gatagtaagt	gagcagagca	720
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<210> 40

<211> 452

<212> DNA

<213> Homo sapien

<400> 40

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ggtttatcgt	gacttttctt	tcttggttac	ttttcgctag	gaaggggagt	tgtaggggca	180
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tcgctgtcac	tgatacttct	tttttctcgt	tcctggctct	gagagactgg	gaaaccaaca	360
gccactgcc	agatggctgt	gatcaggagg	agaactttct	tcattctcaa	cgtttcagtc	420
agttctttct	ctcacctcgg	ccgcgaccac	gc			452

<210> 41

<211> 676

<212> DNA

<213> Homo sapien

<400> 41

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ttccccattt	aaattttaca	ttacttgcca	agaaaaaaaa	aaaattaaaa	ctcaagttac	180
ttgaagcctg	gacacacttc	catgattagc	cgggctaggt	aaaagttggt	ggctttatc	240
ttcctgctct	ataagcagat	ccaggcccta	gaaagatggg	accagggtat	ataattgttt	300
ttgaaaagt	tgctacaaaa	atggatggcc	tggtataagc	caggatacaa	agttaaggat	360
gggggttaagg	gagggacatt	ttcttccaga	agaaaagaca	gaatttctga	agagtcccag	420
tccataattt	tcccaaatg	gttgaggagg	agggtaaaat	ctcaacatga	gtttcaaagt	480
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gccccatccc	cagctaggag	aatggaaatg	gaaactttta	ttgcccagtg	ggtgtgaaag	600
tgggctgaag	cttggttggg	actgaattct	ctaagagggt	tcttctagaa	acagacaact	660
cagacctgcc	cgggcg					676

<210> 42

<211> 468

<212> DNA

<213> Homo sapien

<400> 42

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ctcagccctg	gtgggcagag	aggtagggat	ggggctgtgg	ggatagttag	gcacgcgaat	180
gtaagactcg	ggattagtag	acacttggtg	attaatggaa	atgtttacag	atccccaagc	240
ctggcaaggg	aatttcttca	actccctgcc	ccccagccct	ccttatcaaa	ggacaccatt	300
ttggcaagct	ctatgaccaa	ggagccaaac	atcctacaag	acacagttag	cataactaatt	360
aaaacccctc	gcaaaagccca	gcttgaaacc	ttcacttagg	aacgtaatcg	tgccccctat	420
cctacttccc	cttcctaatt	ccacagacct	gcccgggcgg	ccgctcga		468

<210> 43
 <211> 408
 <212> DNA
 <213> Homo sapien

<400> 43						
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ttcatttcag	gagagcagca	gttaaaccgg	tggattttgt	agttagggaac	ctgggttcaa	120
acctctttcc	actaattggc	tatgtctctg	gacagttttt	tttttttttt	ttttttttta	180
accttttctg	aacttttact	ttctatggct	acctcaaaga	attgttgtag	ggcttgagat	240
aatgcatttg	taaagggtct	gccagatagg	aagatgctag	ttatggattt	acaaggttgt	300
taaggctgta	agagtctaaa	acctacagtg	aatcacaaatg	catttacccc	cactgacttg	360
gacataagtg	aaaactagcc	cgaagtctct	ttttcaaatt	acttacag		408

<210> 44
 <211> 160
 <212> DNA
 <213> Homo sapien

<400> 44						
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ctctctgtgc	tacaatgatt	gcaccttctc	acgcaacact	ccaaccagga	ctttcaacta	120
caacttctcc	gctttggcaa	acaccgtcac	tcttgctgga			160

<210> 45
 <211> 231
 <212> DNA
 <213> Homo sapien

<400> 45						
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ccccaataag	tcgatcagca	aggctgacag	gctgtgagga	aaccccgcc	ttgtagcctg	120
tcacctctgg	gggatgatg	actgcctggc	agacgtaggc	tgtgatagat	ttgggagaaa	180
acctgactca	ccctcaggaa	tccggaggtc	ggtgacattg	tcggtgcaca	c	231

<210> 46
 <211> 371
 <212> DNA
 <213> Homo sapien

<400> 46						
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ttccttatca	ggtagaggtt	ttgggttttt	ttgactatct	ctgatgaatt	tttcatgagt	120
ctgtatatgc	agaatctttt	ccctaaatac	tgcctcgtcc	catgtctgaa	ggcgtaaaat	180
aaagtcattc	atcatttttt	ctttgtacat	gtttatttgt	tctttttcaa	ttacaccaag	240
cattactagt	cagaaggaag	cacttgctac	ctcttgctct	tcctctgcct	ctgggttgga	300

tcattttgat gacattgccc acattactca tgaaggatga caagattgca ctgtgcaatg 360
tcaattgcct t 371

<210> 47
<211> 261
<212> DNA
<213> Homo sapien

<400> 47
gccctgtttt tatacacttc acatttgcag aaatataatg atgccctcat tatcagtgcg 60
catgcacgaa tgaaagatgc tctggattac ttgaaagact tcttcagcaa tgtccgagca 120
gcaggattcg atgagattga gcaagatcct actcagagat ttgaagaaaa gctgcaggaa 180
ctagaaagtg tttccaggga tcccagcaat gagaatccta aacttgaaga cctctgcttc 240
atcttacaag aagagtacca c 261

<210> 48
<211> 701
<212> DNA
<213> Homo sapien

<400> 48
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acatatgcac agatccagtt agtgagtttg tcaagcttaa tctaattggg taagtctcaa 120
agagattatt attccttgatg tttgctttgt attggctaac aaatgtgcag aggtaataca 180
tatgtgatgt ccgatgtctc tgtctttttt tttgtcttta aaaaataatt ggcagcaact 240
gtatttgaat aaaatgattt cttagtatga ttgtaccgta atgaatgaaa gtggaacatg 300
tttctttttg aaagggagag aattgaccat ttattattgt gatgtttaag ttataactta 360
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acagcgtggt ttagaagatt taaatTTTTT tcttgtctgc acaattagtt attcagagca 540
agagggcctg attttataga agccccctga aaagagggtc agatgagagc agagatacag 600
tgagaaatta tgtgatctgt gtgttgtggg aagagaattt tcaatatgta actacggagc 660
tgtagtgcc a ttagaaactg tgaatttcca aataaatttg a 701

<210> 49
<211> 270
<212> DNA
<213> Homo sapien

<400> 49
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tatggaaata gatatttgtg cagctcaatt tatgcagaga ttaaatgaca tcataatact 180
ggatgaaaac ttgcatagaa ttctgattaa atagtgggtc tgtttcacat gtgcagtttg 240
aagtatttaa attaaccact cctttcacag 270

<210> 50
<211> 271
<212> DNA
<213> Homo sapien

<400> 50
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acaataaaaa gttgaacatg cgcatactta tgcatttcac agaagattag taaaactgat 180

ggcaacttca gaattatttc atgaagggtta caaacagtct ttaccacaat tttcccatgg 240
tcttatcctt caaaataaaa ttccacacac t 271

<210> 51
<211> 241
<212> DNA
<213> Homo sapien

<400> 51
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aatggcttat cccacccgcc atgtaagtta ccatgcctgt ctctccctc ctacacattt 120
ccagctcctg ctgcagttat tcctacagaa gctgccattt accagccctc tgtgattttg 180
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t 241

<210> 52
<211> 271
<212> DNA
<213> Homo sapien

<400> 52
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tgcatgctgc ttgctgtaag ttacgatttg gcttcactag ctcaaatttt ttcactccac 180
caaaagataa ggcacaggcc cgtttgtcca atcaagtttg ctgaaaatac tgcagcctga 240
gtgtagacaa acttcccctg aatttgctag a 271

<210> 53
<211> 493
<212> DNA
<213> Homo sapien

<400> 53
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cctcaagggc gaattctgca gatatccatc aactggcgg ccgctcgagc atgcatctag 480
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<210> 54
<211> 321
<212> DNA
<213> Homo sapien

<400> 54
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actgaatgtc aataaactct gtgattttgt taggaagtaa aactgggac tatttagcca 120
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gactttctct ctggagatac ccttttgaat atacaatggc cttggctcac taggtttaaa 240
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gatcgggttc cataactcta a 321

<210> 55
 <211> 281
 <212> DNA
 <213> Homo sapien

<400> 55
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 gaacagccca ccttgggttac agctagcaaa gatgggtact tcaaagtatg gatattaaca 180
 gatgactctg acatatacaa aaaagctgtt ggctggacct gtgactttgt tggtagttat 240
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<210> 56
 <211> 612
 <212> DNA
 <213> Homo sapien

<400> 56
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 taccctagcc tgcacctgtc ctcatctctg caaagtccag ctcccttccc cagggtctctg 180
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<210> 57
 <211> 363
 <212> DNA
 <213> Homo sapien

<400> 57
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 aagtgaatac atctgactgt gctccactcc aacctccagc gtggatgtcc ctgtctgggc 300
 ccttttctg ttttttattc tatgttcagc accactggca ccaaatacat ttaattcac 360
 cga 363

<210> 58
 <211> 750
 <212> DNA
 <213> Homo sapien

<400> 58
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 gtggcccttc ttccaggaaag agcaaataag ttgggtccaa tacttgatgc ttaagggaata 180
 cacaaagggtg cccatcaagc gctcagaaat gctgagagat atcatccgtg aatacactga 240

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actgaaagaa	attgacaaag	aagaacacct	gtatattctc	atcagtaccc	ccgagtcctt	360
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gggtgtcatc	ttcatgaatg	gcaaccgtgc	cagtgaaggct	gtcttttggg	aggcactacg	480
caagatggga	ctgcgtcctg	gggtgagaca	tcccctccct	tggagatcta	aggaaacttc	540
tcacctatga	gtttgtaaag	cagaaatacc	tggactacag	acgagtgcc	aacagcaacc	600
ccccggagta	tgagttcttc	tggggcctcc	gtccctacca	tgagactagc	aagatgaaaa	660
tgctgagatt	cattgcagag	gttcagaaaa	gagaccctcg	tgactggact	gcacagtcca	720
tggaggctgc	agatgaggac	ctgcccgggc				750

<210> 59

<211> 505

<212> DNA

<213> Homo sapien

<400> 59

tggccgccc	ggcaggtcca	gtctacaagc	agagcactct	catggggagc	accagatgag	60
ttccagccgc	agttctttta	taagctttaa	gtgcctcatg	aagacgcgag	gatctcttcc	120
aagtgaacc	tggtcacatc	agggcacatt	cagcagcaga	agtctgtttc	cagtatagtc	180
cttggatgg	ctaaattcca	ctgtcccttt	ctcagcagtc	aataatccat	gataaattct	240
gtacaacact	gtagtcaata	acagcagcac	cagacagcat	attaattctt	ttaccataaa	300
tttgtgtgta	attataatgt	tctatgtgtg	gtgttatcaa	aagaatcact	gtgtctctaa	360
atatcatata	tgtatgtctg	gataaataca	ttgctgtaca	acatctccaa	catgcaggtc	420
atgctctaag	acttggggat	atagagtaat	acatgtttcg	tggacctcgg	ccgcgaccac	480
gctaagggcg	aattctgcag	atatac				505

<210> 60

<211> 520

<212> DNA

<213> Homo sapien

<400> 60

cgtggtcgcg	gccgaggtcc	tcaggacaag	gaaacaggta	tcagcatgat	ggtagcagaa	60
accttatcac	caaggtgcag	gagctgactt	cttccaaaga	gttgtggttc	cgggcagcgg	120
tcattgcctg	cccttgctgg	agggctgatt	ttagtgttgc	ttattatggt	ggccctgagg	180
atgcttcgaa	gtgaaaataa	gaggctgcag	gatcagcggc	aacagatgct	ctcccgtttg	240
cactacagct	ttcacggaca	ccattccaaa	aaggggcagg	ttgcaaagtt	agacttgga	300
tgcattggtg	cggtcagtgg	gcacgagaac	tgctgtctga	cctgtgataa	aatgagacaa	360
gcagacctca	gcaacgataa	gatcctctcg	cttgttcaact	ggggcatgta	cagtgggcac	420
gggaagctgg	aattcgtatg	acggagtctt	atctgaacta	cacttactga	acagcttgaa	480
ggacctgccc	gggcggccgc	tcgaaagggg	cgaattctgc			520

<210> 61

<211> 447

<212> DNA

<213> Homo sapien

<400> 61

agagaggtgt	ttttattctt	tggggacaaa	gccgggttct	gtgggtgtag	gattctccag	60
gttctccagg	ctgtagggcc	cagaggctta	atcagaattt	tcagacaaaa	ctggaacctt	120
tcttttttcc	cgttggttta	ttttagtccc	ttgggcaaac	caatgtcttt	gttcgaaaga	180
gggaaaataa	tccaaacggt	tttcttttaa	cttttttttt	aggttcaggg	gcacatgtgt	240
aggcttgcta	tataggtaaa	ttgcatgtca	ccagggtttg	ttgtacagat	tatttcacat	300
tccagataaa	aagcatagta	ccagataggt	agtttttttg	tcctcacctt	ccttccatgc	360
tccgacctca	ggtaggcccc	agtgtctgac	ctgcccggcg	gcccgtctga	aagggccaat	420

tctgcagata tccatcacac tggccgg

447

<210> 62

<211> 83

<212> PRT

<213> Homo sapien

<400> 62

Lys Lys Val Leu Leu Leu Ile Thr Ala Ile Leu Ala Val Ala Val Gly
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 Phe Pro Val Ser Gln Asp Gln Glu Arg Glu Lys Arg Ser Ile Ser Asp
 20 25 30
 Ser Asp Glu Leu Ala Ser Gly Phe Phe Val Phe Pro Tyr Pro Tyr Pro
 35 40 45
 Phe Arg Pro Leu Pro Pro Ile Pro Phe Pro Arg Phe Pro Trp Phe Arg
 50 55 60
 Arg Asn Phe Pro Ile Pro Ile Pro Ser Ala Pro Thr Thr Pro Leu Pro
 65 70 75 80
 Ser Glu Lys

<210> 63

<211> 683

<212> DNA

<213> Homo sapien

<400> 63

acaaagattg gtagctttta tattttttta aaaatgctat actaagagaa aaaacaaaag 60
 accacaacaa tattccaaat tataggttga gagaatgtga ctatgaagaa agtattctaa 120
 ccaactaaaa aaaatattga aaccactttt gattgaagca aaatgaataa tgctagattt 180
 aaaaacagtg tgaaatcaca ctttggtctg taaacatatt tagctttgct tttcattcag 240
 atgtatacat aaacttattt aaaatgtcat ttaagtgaac cattccaagg cataataaaa 300
 aaagwggtag caaatgaaaa ttaaagcatt tatttttgta gttcttcaat aatgatrcga 360
 gaaactgaat tccatccagt agaagcatct ccttttgggt aatctgaaca agtrccaacc 420
 cagatagcaa catccactaa tccagcacca attccttcac aaagtccttc cacagaagaa 480
 gtgcatgaa tattaattgt tgaattcatt tcagggcttc cttggtccaa ataaattata 540
 gcttcaatgg gaagaggtcc tgaacattca gctccattga atgtgaaata ccaacgctga 600
 cagcatgcat ttctgcattt tagccgaagt gagccactga acaaaactct tagagcacta 660
 ttggaacgca tctttgtaaa tgt 683

<210> 64

<211> 749

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(749)

<223> n = A,T,C or G

<400> 64

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 cctccgtgta aatgttttat gtgttcgctt actgatccca ttcgttgctt ctattgtaaa 120
 ttttctcat ttgtatttat tatctctgtg ttttccccct aaggcataaa atggtttact 180
 gtgttcattt gaaccattt actgatctct gttgtatatt ttccatgccca ctgctttgtt 240

ttctcctcag	aagtcgggta	gatagcattt	ctatcccatc	cctcacgtta	ttggaagcat	300
gcaacagtat	ttattgctca	gggtcttctg	cttaaaactg	aggaagggtcc	acattcctgc	360
aagcattgat	tgagacattt	gcacaatcta	aaatgtaagc	aaagtaagtc	attaaaaata	420
caccctctac	ttgggcttta	tactgcatac	aaatttactc	atgagccttc	ctttgaggaa	480
ggatgtggat	ctccaaataa	agatttagtg	tttattttga	gctctgcatac	ttancaagat	540
gatctgaaca	cctctccttt	gtatcaataa	atagccctgt	tattctgaag	tgagaggacc	600
aagtatagta	aaatgctgac	atctaaaact	aaataaatag	aaaacaccag	gccagaacta	660
tagtcatact	cacacaaagg	gagaaattta	aactcgaacc	aagcaaaagg	cttcacggaa	720
atagcatgga	aaaacaatgc	ttccagtgg				749

<210> 65
 <211> 612
 <212> DNA
 <213> Homo sapien

<400> 65						
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ccccacccca	ggatccggga	ccaaaaataa	gagcaagcag	gcccccttca	ctgaggtgct	120
gggtaggggt	cagtgccaca	ttactgtgct	ttgagaaaga	ggaaggggat	ttgtttggca	180
ctttaaaaat	agaggagtaa	gcaggactgg	agaggccaga	gaagatacca	aaattggcag	240
ggagagacca	tttggcgcca	gtcccctagg	agatgggagg	agggagatag	gtatgagggg	300
agggcgttaag	aagagtagga	gggggtccact	ccaagtggca	gggtgctgaa	atgggctagg	360
accaacagga	cactgactct	aggtttatga	cctgtccata	cccgttccac	agcagctggg	420
tgggagaaat	caccattttg	tgactttctaa	taaaataatg	ggtctaggca	acagttttca	480
atggatgcta	aaacgattag	gtgaaaagt	gatggagaat	tttaattcag	gggaattagg	540
ctgataccat	ctgaaacat	ttggcatcat	taaaaatgtg	acaacctggt	ggctgccagg	600
gaggaagggg	ag					612

<210> 66
 <211> 703
 <212> DNA
 <213> Homo sapien

<400> 66						
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gcacagaacc	aagaattaca	gaaaaaagtc	caggagctgg	agaggcacia	catctccttg	120
gtagctcagc	tccgccagct	gcagacgcta	attgctcaaa	cttccaacaa	agctgccag	180
accagcactt	gtgttttgat	tcttcttttt	tccctggctc	tcatcatcct	gccagcttc	240
agtccattcc	agagtcgacc	agaagctggg	tctgaggatt	accagcctca	cggagtgact	300
tccagaaata	tctgaccca	caaggacgta	acagaaaatc	tggagaccca	agtggtagag	360
tccagactga	gggagccacc	tggagccaag	gatgcaaatg	gctcaacaag	gacactgctt	420
gagaagatgg	gaggggaagcc	aagaccaggt	gggcgcatac	ggtccgtgct	gcatgcagat	480
gagatgtgag	ctggaacaga	ccttcctggc	ccacttcctg	atcacaagga	atcctgggct	540
tccttatggc	tttgcttccc	actgggattc	ctacttaggt	gtctgccctc	aggggtccaa	600
atcacttcag	gacaccccaa	gagatgtcct	ttagtctctg	cctgaggcct	agtctgcatt	660
tgtttgcata	tatgagaggg	tacctgcccc	ggcggccgct	cga		703

<210> 67
 <211> 1022
 <212> DNA
 <213> Homo sapien

<400> 67						
cttgagaaag	caggattggt	ttaaagtcca	agatttaaca	aacttactgt	tcagcatcat	60
attcaagcct	aaaaggaaga	taggattttc	aagatatatt	tccaacttct	ttaacatggc	120

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accatggatg aactgtttct cagcactgtg ctgcttcact tggaaattaag gatgaattgg      180
gaggagacag tatgacatag gtgggtaggt tgggtggtga ggggaaccag ttctaatagt      240
cctcaactcc actccagctg ttctgttcc acacggtcca ctgagctggc ccagtcctct      300
tactcagtg tgtcaccaaa ggcagcttca aggtcfaatg gcaagagacc acctataacc      360
tcttcacctt ctgctgctc tttctgctgc cactgactgc catggccatc tgctatagcc      420
gcattgtcct cagtgtgtcc agggcccaga caaggaaggg gagccatggt gagactccaa      480
ttcccaggcc ttaatcctta accctagacc tgttgctctc agcatcattt atttatctac      540
ctacctaaata gctatctacc agtcattaaa ccatggtgag attctaacca tgtctagcac      600
ctgatgctag agataatttt gttgaatccc ttcaattata aacagctgag ttagctggac      660
aaggactagg gaggcaatca gtattattta ttctgaaca ccatcaagtc tagacttggg      720
ggcttcatat ttctatcata atccctgggg gtaagaaatc atatagcccc aggttgggaa      780
ggggaaaacg gtttgcaaca ttctcctctc tgtaggaggc gagctctgtc tcaactagcta      840
tgcccccca tcaattcacc ctatactcag atcagaagct gagtgtctga attacagtat      900
atthttctaaa ttctagccc ctgctggtga atthgcccct ccccgctcct ttgacaattg      960
tccccgtgtt cgtctccggg ccctgagact ggccctgctt atcttgctga ccttcaccc      1020
ct                                     1022

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<210> 68
<211> 449
<212> DNA
<213> Homo sapien

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<400> 68
ccagatccat tttcagtggg ctggatttct ttttattttc ttttcaactt gaaagaaact      60
ggacatttagg ccactatgtg ttgttactgc cactagtgtt caagtgcctc ttgttttccc      120
agagatttcc tgggtctgcc agaggcccag acaggctcac tcaagctctt taactgaaaa      180
gcaacaagcc actccaggac aaggttcaaa atggttaca cagcctctac ctgtcgcccc      240
agggagaaag gggtagtgat acaagtctca tagccagaga tgggtttcca ctcttctag      300
atattcccaa aaagaggctg agacaggagg ttattttcaa ttttattttg gaattaaata      360
cttttttccc tttattactg ttgtagtccc tcacttggat atacctctgt tttcacgata      420
gaaataaggg aggtctagag cttctattc                                     449

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```

<210> 69
<211> 387
<212> DNA
<213> Homo sapien

```

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<220>
<221> misc_feature
<222> (1)...(387)
<223> n = A,T,C or G

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```

<400> 69
gcccttagcg tgggtcgagg cncgangtct ggagcntatg tgatncctat ggtncncagg      60
cnnatactgc tantctcatt tattctcctg cnacctantc ctctnctctg gaatcacacc      120
attattgcct gttaaactg gactgtgagt accangcaat taatttgcac caanaaagtt      180
gaggggtatta tcanatattg caatctgtac agagggaaga tgatttcaat ttgatttcaa      240
cttaaccttc atctttgtct gttaaacta atagaggggtg tctaataaaa tggcaaattt      300
gngatctcat tnggtataac tacactcttt ttcacagatg tgatgactga atttccanca      360
acctgcccgg gcggnccgntc naagggc                                     387

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<210> 70
<211> 836
<212> DNA
<213> Homo sapien

```

<400> 70

tattccattt	acaaaataaa	ttcagccctg	cactttcttt	agatgccttg	atttccagaa	60
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accctagttt	atttatttat	agatatctgt	ttacaaagtc	tgtagtaaat	cctgatgctg	180
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taaatatgcc	gaagccaagc	acacagtctt	tctaaaagtgt	gtgtatgttt	gtgtgaatgt	360
gaatgatact	gatcttatat	ctgttaaaag	ttgttttaaa	aagctgtggc	atccccattgt	420
tcatatttgc	caagtcttct	gtaaagatgt	ctaggacgaa	atattttatg	tgctaagtca	480
tgtatttgta	aaccagattt	gtttaccact	caaaattaac	ttgttttctt	catccaaaaa	540
agtttatttc	ttccacgtac	ttaaattttc	tgtgtgggta	taatatagct	ttctaatttt	600
tttctttcac	aaaggcaggt	tcaaaattct	gttgaaagaa	aaatgctttc	tgaaactgag	660
gtataacacc	agagcttgct	gtttaaagga	ttatatgatg	tacatcagtt	ctataaatgt	720
gctcagcagt	ttaacatgtg	aatcctgttt	taaagtgtc	agatttcaac	tgtgtaagcc	780
attgatataa	cgctgtaatt	aaaaatgttt	atatgaaaaa	aaaaaaaaaa	aaaaaa	836

<210> 71

<211> 618

<212> DNA

<213> Homo sapien

<400> 71

gttgacagtga	gctcaagtgt	tggtgtatc	agctcaaaac	accatgtgat	gccaatcatc	60
ttccacaggag	caatttgttt	accttttttt	tctgatgctt	tactaacttc	atcttttaga	120
tttaaatcat	tagtagatcc	tagaggagcc	agtttcagaa	aatatagatt	ctagtccagc	180
accaccgta	gttgtgcatt	gaaataatta	tcattatgat	tatgtatcag	agcttctggg	240
tttctcattc	tttattcatt	tattcaacaa	ccacgtgaca	aacactggaa	ttacaggatg	300
aagatgagat	aatccgctcc	ttggcagtgt	tatactatta	tataacctga	aaaaacaaac	360
aggtaatttt	cacacaaagt	aatagatatc	atgacacatt	taaaataggg	cactactgga	420
acacacagat	aggacatcca	ggttttgggt	caatattgta	gactttttgg	tggaatgagat	480
atgcaggttg	atrccagaag	gacaacaaaa	acatatgtca	gatagaaggg	aggagcaaat	540
gccaaagagct	ggagctgagg	aagatcactg	tgaaattcta	tgtagtctag	ttggctggat	600
gctagagcaa	agaggtgg					618

<210> 72

<211> 806

<212> DNA

<213> Homo sapien

<400> 72

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aggactgtgg	tgacaactct	ggtcagggtgt	gatttgacat	gagggccgga	ggcggttgct	180
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ccagtcccc	ttcaaccag	ttgatgtaac	cacctcattt	ttacaaaata	cagaatctat	420
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ccctttaatg	ggattgaaag	cacttttacc	acatggagaa	atatattttt	aatttgatgt	660
gcttttctac	aaggctccact	atttctgagt	ttaatgtgtt	tccaacactt	aaggagactc	720
taatgaaagc	tgatgaattt	tcttttctgt	ccaaacaagt	aaaaataaaa	taaaagtcta	780
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<210> 73
<211> 301
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(301)
<223> n = A,T,C or G

<400> 73
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agtcctttca ggctagctgc atcaactctg ctgattttgt tgccatcaag atgtaattcc 180
gtaaggggaag gaggaagacc ttgaggaatg ctggygatat tggycatcagc aatgcggatg 240
tasgaagagc ttcttcmttc cctggaaagc cccattttca atyccttgag ctcttcakcg 300
g 301

<210> 74
<211> 401
<212> DNA
<213> Homo sapien

<400> 74
agttttacatg atccctgtaa cagccatggt ctcaaactca gatgcttcct ccatctgcca 60
agtgtgttct ggatacagag cacatcgtgg cttctggggc cactcagc ttaggctgtg 120
ggctccacaga gcaatcatct ggctgggcta tgggtgggtt ggctctactc aagaagcaaa 180
gcagttacca gcacattcaa acagtgtatt gaacatcttt taaatatcaa agtgagaaac 240
aagaaggcaa cataataatg ttatcagaaa gatgttagga agtaaggaca gctgtgtaaa 300
gcttgaggct gaaaagtagc ttgccagctt catttctttg gtttcttggg tagtgggccc 360
ccggaacagc aagatgtgag gttctggttc atggatcata t 401

<210> 75
<211> 612
<212> DNA
<213> Homo sapien

<400> 75
ttatttttca atttttattt tggttttctt acaaagggtg acattttcca taacagggtg 60
aagagtgttg aaaaaaaaaa tcaaattttt ggggagcgag ggaaggagtt aatgaaactg 120
tattgcacaa tgctctgac aatccttctt tttctctttt gccacaatt taagcaagta 180
gatgtgcaga agaaatggaa ggattcagct ttcagttaaa aaagaagaag aagaaatggc 240
aaagagaaaag ttttttcaaa tttctttctt ttttaattta gattgagttc atttatttga 300
aacagactgg gccaatgtcc acaaagaatt cctggtcagc accaccgatg tccaaagggtg 360
caatatcaag gaagggcagg cgtgatggct tatttgtttt gtattcaatg attgtctttc 420
cccattcatt tgtcttttta gacagccat ctacaagaac agtgaagtg aacctgctgt 480
tgccctcagc aacaagttca acatcattag agccctgtag aatgacagcc tttttcaggt 540
tgccagcttc ctcatccatg tatgcaatgc tgttcttgca gtggtagggtg atgttctgag 600
aggcatagtt gg 612

<210> 76
<211> 844
<212> DNA
<213> Homo sapien

<400> 76

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ggctttcgag cggccgcccc ggcaggtctg atggttctcg taaaaacccc gctagaaact    60
gcagagacct gaaattctgc catcctgaac tcaagagtg agaatactgg gttgacccta    120
accaaggatg caaattggat gctatcaagg tattctgtaa tatggaaact ggggaaacat    180
gcataaagtgc caatcctttg aatgttccac ggaaacactg gtggacagat tctagtgtg    240
agaagaaaca cgtttggttt ggagagtcca tggatggtgg ttttcagttt agctacggca    300
atcctgaact tctgaagat gtccttgatg tgcagcykgc attccttcga ctctctcca    360
gccgagcttc ccagaacatc acatatcact gcaaaaatag cattgcatac atggatcagg    420
ccagtggaaa tgtaaagaag gccctgaagc tgatggggtc aaatgaaggt gaattcaagg    480
ctgaaggaaa tagcaaattc acctacacag ttctggagga tggttgcacg aaacacactg    540
gggaatggag caaaacagtc tttgaatatc gaacacgcaa tgctgttcct tgacattgca    600
ccaccaatgt ccagaggtgc aatgtcaagg aacggcaggc gagatggctt atttgttttg    660
tattcaatga ttgtcttgcc ccattcattt gtcttttttg agcagccatc gactaggaca    720
gagtaggtga acctgctgtt gccctcagca acaagttcca catcgttggg accctgcaga    780
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aatc

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<210> 77

<211> 314

<212> DNA

<213> Homo sapien

<400> 77

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gacacttaga tttctctctt gtgggaagaa accacctgtc catccactga ctcttctaca    120
ttgatgtgga aattgctgct gctaccacca cctcctgaag aggcctccct gatgccaatg    180
ccagccatcc tggcatcctg gccctcgagc aggcctgcgtt aagtagcgat ctctgtctcc    240
agccgtgtct ttatgtcaag cagcatcttg tactcctggt tctgagcctc catctcgcat    300
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<210> 78

<211> 548

<212> DNA

<213> Homo sapien

<400> 78

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aaggacctcc caggactcta tccagaatga ttattgtaaa gctttacaaa tcccaccttg    180
gccctagcga taattaggaa atcacaggca aacctcctct ctcgagagacc aatgaccagg    240
ccaatcagtc tgcacattgg ttttgttaga tactttgtgg agaaaaacaa aggcctcgta    300
tagtgagcgt ctgtgcctac agagagcctc ccttttggtt ctgaaattgc tgatgtgaca    360
gagacaaaagc tgctatgggt ctaaaacctt caataaagta actaatgaca ctcaaggctc    420
tggaactctg agacagacgg tggtaaaacc cacagctgag attcacattt ccaatttatt    480
ttgagctctt tctgaagctg ttgcttccta cctgagaatt cccattttaga gagctgcaca    540
gcacagtc

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<210> 79

<211> 646

<212> DNA

<213> Homo sapien

<400> 79

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accccgctcac tatgtgaata aaggcagcta gaaaatggac tcaattctgc aagccttcat    60

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ggcaacagcc	catattaaga	cttctagaac	aagttaaaaa	aaatcttcca	tttccatcca	120
tgcatgggaa	aagggtctta	gtatagttta	ggatggatgt	gtgtataata	ataaaatgat	180
aagatatgca	tagtggggga	ataaagcctc	agagtccttc	cagtatgggg	aatccattgt	240
atcttagaac	cgagggattt	gtttagattg	ttgatctact	aatttttttc	ttcacttata	300
tttgaaat	caatgatagg	acttattgga	aattggggat	aattctgttg	tggtattaaa	360
taatattcat	tttttaaaaa	ctcatcttgg	tattgagtta	gtgcattgac	ttccaatgaa	420
ttgacataag	cccataattc	attttaacca	gaacacaaaa	ctagaaaatg	ttactcctta	480
aataggcaac	aatgtatttt	ataagcactg	cagagattta	gtaaaaaaca	tgtatagtta	540
ctttagaaac	aacttctgac	acttgagggt	tacccaatgg	tctccttccc	attctttata	600
tgaggtaaat	gcaaaccagg	gagccaccga	ataaacagcc	ctgagt		646

<210> 80

<211> 276

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(276)

<223> n = A,T,C or G

<400> 80

gtctgaatga	gcttcnctgc	gagatgganc	ancataaccc	agaantccaa	aancntanng	60
aacgnnaaaa	cccgnntngaa	caagnaaacn	gcaactnacg	gccgcctgnt	gnagggcgag	120
gacgcccacc	tctcctcttc	ccagttctcc	tctggatcgc	agncatccan	agatgtgacc	180
tcttccagcc	gccaaatccg	caccaaggtc	atggatgtgc	acgatggcaa	ggtgggtgtc	240
caccacgaa	caggtccttc	gcaccaagaa	ctgagg			276

<210> 81

<211> 647

<212> DNA

<213> Homo sapien

<400> 81

gtcctgcctt	tcatcttttc	tttaaaaaaa	ataaatgttt	acaaaacatt	tccctcagat	60
tttaaaat	atggaagtaa	taaacagtaa	taaaatatgg	atactatgaa	aactgacaca	120
cagaaaaaca	taaccataaa	atattgttcc	aggatacaga	tattaattaa	gagtgcactc	180
gttagcaaca	cgtagacatt	catacatatc	cggtggaaga	ctggtttctg	agatgcgatt	240
gccatccaaa	cgcaaatgct	tgatcttggg	gtaggrraat	ggccccagga	tcttgcagaa	300
gctctttatg	tcaaacttct	caagttgatt	gacctccagg	taatagtttt	caagggtttc	360
attgacagtt	ggtatgtttt	taagcttgtt	ataggacaga	tccagctcaa	ccagggatga	420
cacattgaaa	gaatttccag	gtattccact	atcagccagt	tcgttggtgag	ataaacgcag	480
atactgcaat	gcatttaaac	gcttgaaata	ctcatcaggg	atggtgctga	tcttattgtt	540
gtctaagtag	agagtttagaa	gagagacagg	gagaccagaa	ggcagtctgg	ctatctgatt	600
gaagctcaag	tcaaggtatt	cgagtgattt	aagaccttta	aaagcag		647

<210> 82

<211> 878

<212> DNA

<213> Homo sapien

<400> 82

ccttcttttc	ccactcaatt	cttcctgccc	tgttattaat	taagatatct	tcagcttgta	60
gtcagacaca	atcagaatya	cagaaaaatc	ctgcctaagg	caaagaaata	taagacaaga	120
ctatgatatc	aatgaatgtg	ggtaaagtaa	tagattttcca	gctaaattgg	tctaaaaaag	180

aatattaagt	gtggacagac	ctatttcaaa	ggagcttaat	tgatctcact	tgttttagtt	240
ctgatccagg	gagatcaccc	ctctaattat	ttctgaactt	ggtaataaaa	agttttataag	300
atTTTTatga	agcagccact	gtatgatatt	ttaagcaaat	atgttattta	aaatattgat	360
ccttcccttg	gaccaccttc	atgttagttg	ggtattataa	ataagagata	caacctgaa	420
tatatattgt	ttatacaaaa	tcaatctgaa	cacaattcat	aaagatttct	cttttatacc	480
ttcctcactg	gccccctcca	cctgcccata	gtcaccaaat	tctgttttaa	atcaatgacc	540
taagatcaac	aatgaagtat	tttataaatg	tattttatgct	gctagactgt	gggtcaaatg	600
tttccatttt	caaattattt	agaattctta	tgagtttaaa	atttgtaa	ttctaaatcc	660
aatcatgtaa	aatgaaactg	ttgctccatt	ggagtagtct	cccacctaaa	tatcaagatg	720
gctatatgct	aaaaagagaa	aatatgggtca	agtctaaaat	ggctaattgt	cctatgatgc	780
tattatcata	gactaatgac	atttatcttc	aaaacaccaa	attgtcttta	gaaaaattaa	840
tggtattaca	ggtagagaac	ctcggccgcg	accacgct			878

<210> 83

<211> 645

<212> DNA

<213> Homo sapien

<400> 83

acaaacattt	tacaaaaaag	aacattacca	atatcagtgg	cagtaagggc	aagctgaaga	60
ataaatagac	tgagtttccg	ggcaatgtct	gtcctcaaag	acatccaaac	tgcgttcagg	120
cagctgaaac	aggcttcttt	cccagtga	agcatatgtg	gtcagtaata	caaacgatgg	180
taaatgaggc	tactacatag	gccagttaa	caaactcctc	ttctcctcgg	gtaggccatg	240
atacaagtgg	aactcatcaa	ataatttaaa	cccaaggcga	taacaacgct	atttcccatc	300
taaaactcatt	taagccttca	caatgtcgca	atggattcag	ttacttgcaa	acgatcccg	360
gttgctacac	agatacttgt	ttttacacat	aacgctgtgc	catcccttcc	ttactgccc	420
cagtcagggt	tcctgttgtt	ggaccgaaag	gggatacatt	ttagaaatgc	ttccctcaag	480
acagaagtga	gaaagaaagg	agaccctgag	gccaggatct	attaaacctg	gtgtgtgcgc	540
aaaagggagg	gggaaggcag	gaatttgaaa	ggataaacgt	ctcctttgcg	ccgaggaatc	600
aggaagcggtg	actcacttgg	gtctggggacg	ataccgaaat	ccggt		645

<210> 84

<211> 301

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> {1}... (301)

<223> n = A,T,C or G

<400> 84

tctgatgtca	atcacaaactt	gaaggatgcc	aatgatgtac	caatccaatg	tgaaatctct	60
cctcttatct	cctatgctgg	agaaggatta	gaaggttatg	tggcagataa	agaattccat	120
gcacctctaa	tcacgatga	gaatggagtt	catgggctgg	tgaaaaatgg	tatttgaacc	180
agataccaag	ttttgtttgc	cacgatagga	atagctttta	tttttgatag	accaactgtg	240
aacctacaag	acgtcttgga	caactgaagn	ttaaatatcc	acanggggtt	attttgcttg	300
g						301

<210> 85

<211> 296

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature
 <222> (1)...(296)
 <223> n = A,T,C or G

<400> 85
 agcgtgggtc gcggnncgan gtagagaacc gactgaaacg tttgagatga agaaagtctt 60
 cctcctgac acagccatct tggcagtggtc tgttggtttc ccagtctctc aagaccagga 120
 acgagaaaaa agaagtatca gtgacagcga tgaattagct tcagggtttt ttgtgttccc 180
 ttacccatct ccatttcgcc cacttccacc aattccattt ccaagatttc catggtttan 240
 acgtaatttt cctattccaa tacctgaatc tgcccctaca actccccttc ctagcg 296

<210> 86
 <211> 806
 <212> DNA
 <213> Homo sapien

<400> 86
 tctacgatgg ccatttgctc attgtctttc ctctgtgtgt agtgagtgc cctggcagtg 60
 tttgcctgct cagagtggcc cctcagaaca acagggctgg ccttggaata accccaaaac 120
 aggactgtgg tgacaactct ggtcaggtgt gatttgacat gagggccgga ggcggttgct 180
 gacggcagga ctggagaggc tgcgtgcccg gcaactggcag cgaggctcgt gtgtccccc 240
 ggcagatctg ggcactttcc caaccaggt ttatgccgtc tccagggaag cctcggtgcc 300
 agagtgggtg gcagatctga ccatcccccac agaccagaaa caaggaattt ctgggattac 360
 ccagtcccc ttcaaccag ttgatgtaac cactcattt tttaaaata cagaatctat 420
 tctactcagg ctatgggcct cgtcctcact cagttattgc gagtgttgct gtccgcagtc 480
 tccggggccc acgtggctcc tgtgctctag atcatggtga cccccgcc ctgtggttg 540
 aatcgatgcc acggattgca ggccaaattt cagatcgtgt ttccaaacac ccttgcgtgt 600
 ccccttaatg ggattgaaag cacttttacc acatggagaa atatattttt aatttgtgat 660
 gcttttctac aaggccact atttctgagt ttaatgtgt tccaacactt aaggagactc 720
 taatgaaagc tgatgaattt tcttttctgt ccaaacaagt aaaataaaaa taaaagtcta 780
 tttagatgtt gaaaaaaaaa aaaaaa 806

<210> 87
 <211> 620
 <212> DNA
 <213> Homo sapien

<400> 87
 tttttgcatc agatctgaaa tgtctgagag taatagtttc tgttgaattt tttttgttc 60
 atttttctgc acagtccatt ctgtttttat tactatctag gcttgaaata tatagtttga 120
 aattatgaca tccttcctct ttgttatttt cctcatgatt gctttggcta ttcaaagttt 180
 attttagttt catgtaaaatt tttgaattgt attttccatt attgtgaaaa tagtaccact 240
 gcaattttta taggaagttt attgaatcta tagattactt tggataatat ggcacttcaa 300
 taatattcat gttttcaatt catagacaaa atattttaaa atttatttgt atcttttcta 360
 atttttcctt tttttattgt aaagatttac ctcttgggtt aatattttcc tcagaaattt 420
 attattttaag gtatagtcaa taaaattttc ttcctctatt ttgtcagata gtttaagtgt 480
 atgaaacat agatatactt gtatgttaat tttatatatt gctaatttac tgagtgtatt 540
 tattagttta gagaggtttt aatgtactgt ttatggtttt ttaaataata gattacttat 600
 tttttaaaaa aaaaaaaaaa 620

<210> 88
 <211> 308
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(308)
 <223> n = A,T,C or G

<400> 88
 tagctgtgnt cagcaggccg aggttttttt tttttttgag atggagtctc gccctgtcac 60
 ccaggctgga gtgcagtggc ctgatctcag ctacttgcaa gctccacctc ctggattcac 120
 gctattctcc tgccctcagcc tcccaagtag ctgggactac aggcgcccgc caccacgccc 180
 agctaattnt ttgnattttt agtacnagat gcggtttcat cgtgttagcc agcatggnc 240
 cgatctcctg acctcgtgaa ctgcccgcct cggcctccca aagacctgcc cgggcnggcc 300
 gctcgaaa 308

<210> 89
 <211> 492
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(492)
 <223> n = A,T,C or G

<400> 89
 agcggccgcc cgggcaggtc tgttaagtaa catacatatc accttaataa aaatcaagat 60
 gaaatgtttt agaaactatt ttatcaaaag tggctctgat acaaagactt gtacatgatt 120
 gttcacagca gcaactattaa tgccaaaaag tagacaaaac ctaaagtgtc attaactgat 180
 aagcaaaatg tggatatatc atacaatgga atattatgta gccacaaca tggcatggag 240
 tactacaaca tggatgagcc tcaaaaacgt tatgctaaat gaaaaaagtc agatatagga 300
 aaccacatgt catatgatcc catttatatg aaatagccag aaaaggcaag tcatagaaac 360
 aagatagatc ggaaaaatggg ttggaggact acaaattggc ccagggatct ttgaagttga 420
 tggaaatggg ctaaaatcag actgtgngtg tggttgaaca agtctgtaaa ttaccacaaa 480
 tgcgttaata ca 492

<210> 90
 <211> 390
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(390)
 <223> n = A,T,C or G

<400> 90
 tcgagcggcc gcccgggcag gtacaagctt tttttttttt tttttttttt ttttctaaca 60
 gttctctgtt ttattgcaat acagcaaagt ctggttaata ttaagnagata tcaacataaa 120
 gtattggtga ggagtctttt gtgacatttt ttaccatccc accttaataa tttctgtgca 180
 aaanaatcca catcattgtt tgggtancana ggatctctta aaaagtcccc taanacactg 240
 agggcataaa accaaacaaa ataaaataag gagtgatagg ctaaagcagt atcttcccc 300
 ccatccacat ttgncaagca ttatattcta accaaaaaat gatcacacca ggccatgcaa 360
 aactgtccaa tattaccgag aaaaaacctt 390

<210> 91
 <211> 192

<212> DNA

<213> Homo sapien

<400> 91

```

agcgtggtcg cggccgaggt ctgtcaatta atgctagtcc tcaggattta aaaaataatc      60
ttaactcaaa gtccaatgca aaaacattaa gttggtaatt actcttgatc ttgaattact    120
tccggttacga aagtccttca catttttcaa actaagctac tatatttaag gcctgcccgg    180
gcggccgctc ga                                     192

```

<210> 92

<211> 570

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(570)

<223> n = A,T,C or G

<400> 92

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agcgtggtcg cggccgaggt ctgacaacta acaaagaagc aaaaactggc atcttggaca      60
tcctagtatt acacttgcaa gcaattagaa cacaaggagg gccaaaggaa aagtttagct    120
ttgaatcact tccaaatcta ctgattttga ggttccgcag tagttctaac aaaacttttc    180
agacaatgtt aactttcgat taagaaagaa aaaaacccca aacatcttca ggaattccat    240
gccaggttca gtctcttcca gtgagcccg cctgctaaaag tccacgtgca ccattaatta    300
gctgggctgg cagcaccatg taaaaagaag cctattcacc accaaccaca cagactagac    360
atgtaaaagta ggatcaagta atggatgaca accatggtcg tgggaatatgg tcaatgagag    420
tcagaaaagt acaggcacca gtacaagcag cagataacag aattgacggg ccaaaggata    480
aaaataggct tatttaaata ggatgctaca gaacacatnc acttctaatt ggaagctgct    540
ttacactggg tggcattgna ccatatgcat                                     570

```

<210> 93

<211> 446

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(446)

<223> n = A,T,C or G

<400> 93

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tcgagcggcc gcccgggcag gtccagggtt ttatttagtt gtgtaatctt ggacaagtta      60
cctaactttt ttgagtctga atatatttaa tctgcaaaat gagaatcatg ataatacgtc    120
ataggcttaa ttaggaggat taaatgaaat aatttatagg tggtgccatg gttacatata    180
agtattagta gttaattctt ttcctttgtt tacttttata gtatagggtg gatgaagggt    240
ccagtatagg caaaaatact acttgggggt aaagtagagt gtgatacttt atttgaaatg    300
ttccctgaat ctgatcttta ctttttgnta ctgctgcact acccaaatcc aaattttcat    360
cccaacattc ttggatttgt gggacagcng tagcagcttt tccaatataa tctatactac    420
atcttttctt actttggtgc tttttg                                     446

```

<210> 94

<211> 409

<212> DNA

<213> Homo sapien

<400> 94

cgagcggccg cccgggcagg tccatcagct cttctgctta gaatacgagg cagacagtgg	60
agaggtcaca tcagttatcg tctatcaggg tgatgaccca agaaagggtga gtgagaagggt	120
gtcggcacac acgcctctgg atccacccat gcgagaagcc ctcaagttgc gtatccagga	180
ggagattgca aagcgccaga gccaacactg accatgttga aggcgttctc tccaggctgg	240
attcactgca ctcggaagaa ttctgcccag ggaatttagt gtgggggtac caggaccagt	300
ttgtcttgat cttgagaccc ccagagctgc tgcattccata ggggtgtgca ggactacacc	360
tggcctgcct tgcagtcatt ctttcttata tgttgaccca tttgcccga	409

<210> 95

<211> 490

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(490)

<223> n = A,T,C or G

<400> 95

tcgagcggcc gcccgggcag gtcctacttg tttgcagctt ccacacactg cacctaccta	60
ctacctctct tccatgctta actgggttta gaaagggtgag ctatgcgtag aagaactact	120
tgggatattc aagtgtctga ttgaaacgat aagcctatag ataacagtct gaagctgcaa	180
gggagacttt gttagtacac tactataaac aggtaaacta cctgtttgta cttgatatag	240
tgcattatgaa atgactgatt taatacaaaa ctacagaaca tgcaaaattt tttctgagat	300
gttaagtatt acttcagtgg agaacaaaac ttacttaacc ttctgctaata gcatgtagta	360
ccagaaagca aacatgggtt tagcttcctt tactcaaaat atgaacatta agtgggtgtg	420
aattttgtct gccaaagtgg tcagaaaata cattataaat aacctaagtt aaaaaaaga	480
aactgngaac	490

<210> 96

<211> 223

<212> DNA

<213> Homo sapien

<400> 96

agcgtggctg cggccgaggt ctggaagccc accctaggac ttgaatggca ccttgctcctt	60
tctctgccag taatgcaatc caacacaata tgctacaggg aaaacagaat ttccacgggtg	120
ccgccctctg gtacaaggga aacagcacgc aaagcaaaag gccacagagg gctccctgag	180
aatccagtac aactaagcga ggacctgccc gggcgggcgc tcg	223

<210> 97

<211> 527

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(527)

<223> n = A,T,C or G

<400> 97

tcgagcggcc gcccgggcag gtctgtgcag gagacactga agtgggtagt gtccataatc	60
tttttagcct gttgctgaaa ttccagttgt actccttcaa accaaaatgc ttacaggatc	120

atgggaaagc	ctcggttgca	gaaatcaaga	caggcaagtg	ggaagataac	tcggctttga	180
gggttaaacag	atctgggttc	aaagcatagt	ttcactctct	gtcttgtgaa	gtgtcctggg	240
tgaagtcatt	tcctctcttg	aatttcagag	aggatgaaaa	tataaaaagt	ataataacta	300
tcttcataat	ctttgtgagg	attaaagaag	acgaagtgtg	tgaaaagcta	agcacagagc	360
aggcattcta	caataagtag	ttattatttt	tggaaccatc	ccgnccctag	ccccagccca	420
attaccttct	cttagntctt	tcatatcgaa	ngccgtaatc	ttgaccttct	cttgcnactg	480
gattggtgct	ggttgatgcc	caaacttccc	gagatgctgt	ctgggaa		527

<210> 98

<211> 514

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(514)

<223> n = A,T,C or G

<400> 98

tcgagcggcc	gcccgggcag	gtctgggtcc	catggccctt	gggggtggcct	gactctgtca	60
ctattcctaa	aaccttctag	gacatctgct	ccaggaagaa	ctttcaacac	caaaattcat	120
ctcaatttta	cagatgggaa	aagtgattct	gagaccagac	cagggtcagg	ccaagggtcat	180
ccagcatcag	tggctgggct	gagactgggc	ccaggggaacc	ctgtctgctc	ctctttttcc	240
cagagctgtg	agttctctag	ccaaggctgc	actcttgagg	gagagccagg	aagcatagct	300
gaggccatga	caacctcact	cttcacctga	aaatttaacc	cgtggcagag	gatccaggca	360
catataggct	tcggagccaa	acaggacctc	ggccgcgacc	acgctaagcc	gaattccagc	420
acactggcgg	ccgttactag	tggatcccga	gcttnggtac	caagcttggc	gtaatcatgg	480
gcatagctgg	ttcctggggc	gaaaatggta	tccg			514

<210> 99

<211> 530

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(530)

<223> n = A,T,C or G

<400> 99

tcgagcggcc	gcccgggcag	gtctgaagaa	acagggtataa	atttggcagc	cagtaatttt	60
gacaggggaag	ttacagcttg	catgacttta	aatatgtaaa	tttgaaaata	ctgaatttcg	120
agtaatcatt	gtgctttgtg	ttgatctgaa	aaatataaca	ctggctgtcg	aagaagcatg	180
ttcaaaaata	tttaattcac	ttcaaaatgt	catacaaatt	atgggtggtt	ctatgcaccc	240
ctaaagcttc	aagtcattta	gttcagggtac	atactaaagt	aatatattaa	ttcttccagt	300
acagtgggtg	ttcataccat	tgacatttgc	ataccctaga	ataatttaag	aaagacatgt	360
gtaatatcca	caatgttcag	aaaagcaagc	aaaagggtcaa	ggaacctgct	ttgggttcttc	420
tggagatggn	ctcatatcag	cttcataaac	attcatttcta	caaaatagta	agctaaccat	480
ttgaacccca	atttccagat	taagcatatt	ttctcataaa	tnatgaagcc		530

<210> 100

<211> 529

<212> DNA

<213> Homo sapien

<400> 100

agcgtggtcg	cggccgaggt	ccaggcacgg	tggcttatgt	gtgtaatccc	agcacttggg	60
gaggctgagg	gaggtggatc	acttgagtcc	aggagtttga	gaccagtctg	ggcaacatgg	120
cgaaacttca	tcaactacaa	agaagaaaaa	aattagccag	gtgtgggtgg	gtatgcctgt	180
agtcccagat	actctgggtg	ctgaggtgag	aggatagctt	gagcccagga	aattgaggct	240
gcagtgaact	atgattgcac	tactgtgctc	cagcttgggc	aacagagtga	gatcttgtct	300
ccaaaagtcc	ttgaaggatt	ttaggaagtt	gttaaaaagtc	ttgaaacgat	gtttgggggc	360
atgttagggg	tcttgaatgt	ttaattcctc	taataactgc	ttattcaaga	gaagcatttc	420
tgactgggtg	cggggcagtg	gcttcatgcc	ccataatccc	agtactttgg	gaggctgaag	480
caggaacatt	gcttgagccc	aggacttcaa	gaacagcctg	ggtaacata		529

<210> 101

<211> 277

<212> DNA

<213> Homo sapien

<400> 101

tcgagcggcc	gcccgggagc	gtcgcaggaa	gaggatggaa	actgaggagt	ccaggaagaa	60
gagggaacga	gatcttgagc	tggaaatggg	agatgattat	attttggatc	ttcagaagta	120
ctgggattta	atgaatttgt	ctgaaaaaca	tgataagata	ccagaaatct	gggaaggcca	180
taatatagct	gatttatattg	atccagccat	catgaagaaa	ttggaagaat	tagaaaaaga	240
agaagagctg	agaacagacc	tcggccgcga	ccacgct			277

<210> 102

<211> 490

<212> DNA

<213> Homo sapien

<400> 102

gcgtggtcgc	ggccgaggtc	tgacggcttt	gctgtcccag	agccgcctaa	acgcaagaaa	60
agtcgatggg	acagttagag	gggatgtgct	aaagcgtgaa	atcagttgtc	cttaattttt	120
agaaagattt	tggttaactag	gtgtctcagg	gctgggttgg	ggtcctaaag	gtaaggaccc	180
cctgccctta	gtggagagct	ggagcttgga	gacattaccc	cttcatacaga	aggaattttc	240
ggatgttttc	ttgggaagct	gttttggtcc	ttggaagcag	tgagagctgg	gaagcttctt	300
ttggctctag	gtgagttgtc	atgtgggtaa	gttgaggtta	tcttgggata	aagggtcttc	360
tagggcacaa	aactcactct	aggtttatat	tgtatgtagc	ttatatTTTT	tactaagggtg	420
tcaccttata	agcatctata	aattgacttc	tttttcttag	ttgtatgacc	tgccccgggc	480
ggccgctcga						490

<210> 103

<211> 490

<212> DNA

<213> Homo sapien

<400> 103

gagcggccgc	ccgggcaggt	ccaaaccagc	ttgctcataa	gtcattaacc	aatccatta	60
taggtaattt	gttcagttca	atgtttacaa	ttcttatgga	aaaaattagc	aacacacaca	120
tttaaaacgt	gtgcatttac	ctttgcgtga	gtgcttaaaa	tacatatctc	tatttcaaga	180
tgacatttaa	aaattattct	aatatatcag	cagcaaaaaat	ataatttgca	attcaaaaaa	240
actaaactag	aatccttaag	ttattctcat	gtttacagtt	gtgattcttt	aataaatact	300
attatgcagc	tctattgttt	aagctttctg	gatttggttt	aaacacatgc	atatatattg	360
tcaattgtgg	gaagctttac	aagtatatatt	ccatgcactt	tttggacaga	gttctaacag	420
agccagccag	tcacaaaaac	aggcaagaca	aaagttgaat	taactggggc	aaaataggac	480
tcttatgcaa						490

<210> 104
 <211> 489
 <212> DNA
 <213> Homo sapien

<400> 104
 cgtggtcgcg gccgaggtcc aggctggtct cgaactcctg accttgtgat ctgcccgcct 60
 cggcctccca aagtgttggg attacaggca tgagccactg cgcccgaccg agttgaacat 120
 ttaatgtcag actaggccag agtttctcaa tctttttatt ctcaactccc aaaggagccg 180
 ttggagattt tccctcaat ctctctcctt catgaaattt cataccacaa atatagtatg 240
 ttttatttat gtactgtgac cctttgaagg atcacaaacc aatataatag tttttctttt 300
 taaccctgca aggaccaagt ttttgcccct gttggaaatg cataaactgg actgatgaat 360
 tggatatagat ggctttttatc atgaggatca gaaaaacttg aaattccttg gctacgacac 420
 tccatattta tcacgtata gggaggacct tggatatggg aagtagaaac acttctacac 480
 ttacagca 489

<210> 105
 <211> 479
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(479)
 <223> n = A,T,C or G

<400> 105
 gcgtggtcgc ggccgaggtc tgactggctt cagccccaga agttgagctg gccttttagac 60
 aaaataattg cacctccctc tgctgcttat tcccttccgt ttttcatttg agtgatgaaca 120
 gttagataaa atctgtggct gnctcttcca cttgtctcta gtttccattg ctgtgagcag 180
 gccctcctat gccccgcatt tagctacaat gctgtggact cacttgatc tttttctccg 240
 agctttgtct agaaatatgt gaaggtagag ttaagtgtt ctctgtgtag atccacttag 300
 cctgtctgc tgtctcgatg ggcgttgcct cgtctctcct ctcttccatc ctttccattt 360
 gcttctcacc accttctggc ttcttttctt aatgcaataa aggcagtttc taacaaagaa 420
 agaatgtggg ctttgaggtt agacagacct ggnntttaa tctgcttctg gctctccaa 479

<210> 106
 <211> 511
 <212> DNA
 <213> Homo sapien

<400> 106
 tcgcgccga ggtccaaaac gtggattcca atgacctgcc ttgagccgc ggttgccagg 60
 agttggacct gcagtagtat gggaagctca cggcctaaat accgactgcc ctctgacccc 120
 accgtccagc gattctagaa ctttctagt aggaagaca tagcaaggga ttttcatgat 180
 tgggaaatac tgggagacaa gctgaagatt tgtaagggc tatgcttctg tcatctttta 240
 ggtatttaag gctactcctt tagctagcta ctttgagctg tttaaagtga ctatctcctt 300
 acacagagtt acacaatgag catctctgaa agagaatatt accctggatt tccaaagatg 360
 tactctaaca ggatgaccag gcaaaagggtg acccggggga ggagtctgtt ataactctg 420
 gaccacatg ttctcaaggc acttcagaac tttgggaaat cattttgtac cggatcctca 480
 gaaagcattt atggaaatac acatccttta g 511

<210> 107
 <211> 451
 <212> DNA

<213> Homo sapien

<400> 107

```

ggccgcccgg gcaggtccag aatatcaaat caaaagggtca caaatgttca cttcctcctc      60
caccctctta catattgat cttcaattgc aatagggagt gtaagatggg catttttagag      120
acgtagtgtc atcagcagaa gcaaaccat cttatacaaa tgggttttgg ggataggaaa      180
aggctgctaa aaattcacia gtcaccattc ccagaaagca atgaatagcc gtagaagacc      240
aagggaagatc aacaagtttc caaagtgtta aagccagaga tttggccctt ccaaaatacc      300
accaggacgc ctggacccgt gggctctccg catgtcacca ctgactgccg ggatgctgct      360
gcacctccct tccttgagac acaacagaga gacagtgaag tcaccaaga ctgggatcat      420
cagaggctcc tcatgcttgc tacagagaag c                                     451

```

<210> 108

<211> 461

<212> DNA

<213> Homo sapien

<400> 108

```

ccgcccgggc aggtcctgaa aacattcaga ctaatcaaaa tgggtactact gtaacttctt      60
ataatacata atataaaagt ttttgaaaga tatagacaca attaacccct aaacaacaca      120
ctatctgatt ctcaaaagca atggctatct aacaagatgt aaaaggacaa taacatatca      180
aagaactttc acacacctaa agatagcatt tagcagcaag ttagtcagac aaaacaaaca      240
caaatatctt cacttttctt atgtttgttt ttaactttac ttcataaagc cactgataat      300
tgagggtttc ttcaagtata agattttctaa aattaaaaac tgtttttgac atatttttat      360
aaagaaataa aaagcaaaac gcaatccaac tatttatatg agtcctctct ctccaacagc      420
tttagatggg tttctgagta cttttttaca cagaatattt t                                     461

```

<210> 109

<211> 441

<212> DNA

<213> Homo sapien

<400> 109

```

ggccgcccgg gcaggtctga ttataagaga aagaaatcca gtgacacgag ggcaggcagg      60
ccccgctctg ctctgatcga gaaaagcttc ctgatgtcag ggagatggaa ctgccaccat      120
cagaaccatg gcactttggg tgaagggtgtg tcagcgacca agggggcagg aaatgggcag      180
tgactaaggg ggcaggaaac aggcaggcac atggcaaggt tctcccagcc catcagccca      240
gtgatggcct cgattttgaa gctgcactac tgtctgaaaa gcacaattac tggtgactct      300
taacaaactt cagcatactg gggaaaggaga ctgtcaagta actgaattgg aaagatgaaa      360
aagaaccatc tctaaaagtt gatgcttgtc agaagaataa cctcctttgt gcaagtcttg      420
caacatcttc attcaaccac a                                     441

```

<210> 110

<211> 451

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(451)

<223> n = A,T,C or G

<400> 110

```

ggtcgcggcc gaggtctggg gaaggggtga gaatccctgg gccttgccca gtcctgagct      60
ctgggtgtct gcaggggaagc acagtgggtga gttagtgtta aagaaagcat ccagagaggt      120

```

```

aagaggggct tgggtagcac cctttgcctc tgtcacttcc gcaaaaactt cttgttgagg 180
aggaagatga gaagggttgac attgactttg gccttggtga agagtttcat gacagccaca 240
ccctcatact ggagctgcan gagatcctga tagtgaagct tgaaatcgct ccatgtccac 300
acccaggaac ttggcattta cttcaaactt tcctgcctca tctcccggcg tgatgtcaaa 360
natgacgttt cttgaagtga gaggcgggaa agatcttcaa tttccaccaa agacaccctt 420
tttccaggaa gcttgagcaa caagtgtaat g 451

```

<210> 111

<211> 407

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(407)

<223> n = A,T,C or G

<400> 111

```

ggccgacgtt cgacctgact tctttngagc agntgncact acccgtcttg aggaatgccg 60
actgcagaca gtggcccang gcaaagagtg tgcgtcatcg atganattgg naagatggag 120
ctcttcagtc agnttttcat tcaagctgnt cgtcagacgc tgtctacccc agggactata 180
atcctnggca caatcccagt tcctanagga aagccactgn ctctttaga agaaatcana 240
cacanaaagg atgtgaacng tgtttaatgt caccaaggga aaacatgaaa ccaccttctg 300
ccagatatcg ggacgttgcg tgcagatcaa gcacgnaagt gaagacgcgt gcattccttg 360
ccttcctgta acgantgccc agntcaagaa gancctgatg gaaccct 407

```

<210> 112

<211> 401

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(401)

<223> n = A,T,C or G

<400> 112

```

tcgcggccga ggtcggccga ggtctgacat ctggtgtctg tgataaccac ttctgtattg 60
cgtcttaacc acttctgtat tgtgtggttt taactgccta aggcggcaat gggcagtggg 120
cccccttccc ttaggatggg tatcaattca acaatattta taaggcattt actgtgtgct 180
aagcatttgg aagaccagc ctacaaaata agacatagtt cctgccctcc aggcagcag 240
agggaggcac aaatacccag gaatctctga tgggtgtgaa gtgcggtcgt gggccacaga 300
aaatgaccgt catggagacc ctgctaaagg tcggaccctg agcccaaagg ggtattcaga 360
agnggagatg attttgcccc cactcataga tgggtggcaa a 401

```

<210> 113

<211> 451

<212> DNA

<213> Homo sapien

<400> 113

```

gtcgcggccg aggtccatat taaaaagtcc atcataaaca aagactcctc ctcatggtat 60
gaatatgtc catatgccca taatggtgca taacggactt agaaattcca atgagcttta 120
gggttgaaat ttccaatgac ctgagcaagg cagctcccta tagcttctgg ataactttt 180
acaccagag ttcaggctta aacagaccta tcaacacaat tattttcggg ttgtctgtct 240

```

33

```

agaaaacggc aatgctcaaa ggaatataaa taaggggtggg gggacatatg cttccagcct      300
ggcctttctc catgtggtaa aaaacaatgg aatggctgtg ttaatttttt tttaatcttt      360
tctgaccttt actatgtttg gtaatggaaa taagtcaggg aaaacaaaat gaacaggtct      420
catcacttaa ttaatactgg gttttcttct t                                     451

```

```

<210> 114
<211> 441
<212> DNA
<213> Homo sapien

```

```

<400> 114
ggcgcgccgg gcaggtccat cctgtcagag atgggagaag tcacagacgg aatgatggat      60
acaaagatgg ttcactttct tacacactat gctgacaaga ttgaatctgt tcatttttca      120
gaccagtctc ctggtccaaa aattatgcaa gaggaagggtc agccttttaa gctacctgac      180
actaagagga cactgttggt tacatttaat gtgcctggct caggtaacac ttaccctaaag      240
gatatggagg cactgctacc cctgatgaac atgggtgattt attctattga taaagccaaa      300
aagttccgac tcaacagaga aggcaaacaa aaagcagata agaaccgtgc ccgagtagaa      360
gagaacttct tgaacttga cacatgtgca aagacaggaa gcagcacagt ctcggcgagg      420
ggaagaaaaa aagaacagag a                                     441

```

```

<210> 115
<211> 431
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(431)
<223> n = A,T,C or G

```

```

<400> 115
gccgcgccgg caggtccatt ggcggtgaca aaaggaaaag aagcaaagag actcagtcga      60
taatgctgat tagttagaag aaagggtctag gattgagaaa gtaccaggaa cttttaatta      120
tttaaaagag aatgctgact gttaatgttt taaatcttac tgttcaaagt tactaatatg      180
aatttttacc ctttgtgcat gaatattcta aacaactaga agacctccac aatttagcag      240
ttatgaaagt taaacttttt attataaaaa ttctaaacct tactgtctct ttaccaggaa      300
catgacacac tatttancat cagttgcata cctcgccaat agtataatc aactgtcttg      360
cccgaacaat catctccatc tggaagacgt aagcctttag aaacacattt ttctattaat      420
ttctctagaa c                                     431

```

```

<210> 116
<211> 421
<212> DNA
<213> Homo sapien

```

```

<400> 116
gtcgcggccg aggtccagaa atgaagaaga agtttgcaga tgtatttgca aagaagacga      60
aggcagagtg gtgtcaaadc tttagcggca cagatgcctg tgtgactccg gttctgactt      120
ttgaggaggt tgttcacat gatcacaaca aggaaccggg gctcgtttat caccagttag      180
gagcaggacg tgagcccccg ccctgcacct ctgctgttaa acaccccagc catcccttct      240
ttcaaaaagg atcctttcat aggagaacac actgaggaga tacttgaaga atttgattc      300
agcccgcgaa gagatttatc aagcttaact cagataaaat cattgaaagt aataaggtaa      360
aagctaagtc tctaacttcc aggccccagg ctcaagtga tttcgaatac tgcatttaca      420
g                                     421

```

<210> 117
 <211> 489
 <212> DNA
 <213> Homo sapien

<400> 117
 agcgtggtcg cggccgaggt aaggctgcga ggttgtggtg tctgggaaac tccgaggaca 60
 gagggctaaa tccatgaagt ttgtggatgg cctgatgata cacagcggag accctgttaa 120
 ctactacgtt gacactgctg tgcgccacgt gttgctcaga cagggtgtgc tgggcatcaa 180
 ggtgaagatc atgctgccct gggacccaac tggtaagatt ggccctaaga agccccctgcc 240
 tgaccacgtg agcattgtgg aacccaaaga tgagatactg cccaccaccc ccattctcaga 300
 acagaagggt gggaagccag agccgcctgc catgccccag ccagtcccca cagcataaca 360
 gggctctcctt ggcagacctg cccgggcggc cgctcgaaag cccgaattcc agcacactgg 420
 cggccgttac tagtggatcc cagctcggta ccaagcttgg cgtaatcatg gtcatactgt 480
 gtttctctgt 489

<210> 118
 <211> 489
 <212> DNA
 <213> Homo sapien

<400> 118
 tcgagcggcc gcccgggcag gtattgaata cagcaaaatt ctatatacaa agtgacctgg 60
 acctgctgct tcaaaacatg atcctttctt actaatatct tgatagtcgg tccatagagc 120
 attagaaagc aattgactct taaataaaca gaaaagtggc taatgcacat taaatgaatg 180
 gcctaactac tggaaacttta gtagttctat aagggtgatta acataggtag gatccagttc 240
 ctatgacagg ctgctgaaga acagatatga gcatcaagag gccattttgt gcactgccac 300
 cgtgatgcca tcgtgtttct ggatcataat gttcccatta tctgattcta gacacaccac 360
 aggaatatca gtggggtcag aggttagctt agctgcttgc tgggctagaa cagatatcac 420
 tccagcatgc tcatctgaca gggccccgcg gcaaccacaga ttaagtcctt gtgaatctgt 480
 gcacaggga 489

<210> 119
 <211> 181
 <212> DNA
 <213> Homo sapien

<400> 119
 taggttccag agacttttgg cccaggagga atatttactt ttagctctgg acatcattac 60
 aaaaaggaat atttcccaaa cctcttcaga ccgagaatac atgggtaaaa ttattaaata 120
 gttgtataat aaaaataatt ttttccttaa aaaaaaaaaa aacctcggcc gcgaccacgc 180
 t 181

<210> 120
 <211> 489
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(489)
 <223> n = A,T,C or G

<400> 120
 gcgtggtcgc ggccgaggtc catttaaaac aaagaaaaat actaaagcca ctagtaaaca 60

35

```

tctgatgtgc aaaatacaac atcctctagt tggctttatg ccattattac ataagctcca 120
aatagctcat cttaaattaa aaagaaaaag tggctgtccc atctctgctg cataaatcag 180
atTTTTTTTT aaaggTTtag agtactTTaa ggaagggaag ttcaaaactg ccagtgaat 240
tcacagagaa tacaaattta gcaatttaat ttcccaaagc tctttgaaga agcaagagag 300
tctctcttct taatgcagtg ttctcccaag aggaactgta attttgcttg gtacttatgc 360
tgaggagatat gcaaaatgtg tttttcaatg tttgctagaa tataatgggt cctcttcagt 420
gnetggttca tcctggaact catgggttaa gaaggacttc ttggagccga actgcccggg 480
cgggccntt 489

```

<210> 121
 <211> 531
 <212> DNA
 <213> Homo sapien

```

<400> 121
cgagcggccg cccgggcagg tggccagcgc tgggtcccga gacgccgaga tggaggaaat 60
atttgatgat gcgtcacctg gaaagcaaaa ggaaatccaa gaaccagatc ctacctatga 120
agaaaaaatg caaactgacc gggcaaatag attcgagtat ttattaaagc agacagaact 180
ttttgcacat ttattcaac ctgctgctca gaagactcca acttcacctt tgaagatgaa 240
accagggcgc ccacgaataa aaaaagatga gaagcagaac ttactatccg ttggcgatta 300
ccgacaccgt agaacagagc aagaggagga tgaagagcta ttaacagaaa gtcctcaaagc 360
aaccaatgtt tgacttcgat ttgaagactc tccatcgtat gtaaaatggg gtaaaactgag 420
agattatcag gtcccagga ttaaaactggc tcatttcttt gtatgagaat ggcacatg 480
gtatccttgc agatgaaatg ggcctaggaa agactcttca acaatttctc t 531

```

<210> 122
 <211> 174
 <212> DNA
 <213> Homo sapien

```

<400> 122
tcgagcggcc gcccgggcag gtctgccaac agcagaggcg gggcctccgg catcttcaaa 60
gcacctctga gcaggctcca gccctctggc tgcgggaggg gtctgggggc tcctctgagc 120
tcggcagcaa agcagatgtt atttctctcc cgcgacctcg gccgcgacca cgct 174

```

<210> 123
 <211> 531
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(531)
 <223> n = A,T,C or G

```

<400> 123
agcgtggctg cggccgaggt cctcaaccaa gagggttgat ggcctccagt caagaaactg 60
tggctcatgc cagcagagct ctctcctcgt ccagcaggcg ccatgcaagg gcaggctaaa 120
agacctccag tgcatcaaca tccatctagc anagagaaaa ggggcactga agcagctatg 180
tctgccaggg gctagggggt cccttgcaaga cagcaatgct acaataaagg acacagaaat 240
gggggagggt ggggaagccc tatttttata acaaagtcaa acagatctgt gccgttcatt 300
ccccagaca cacaagtaga aaaaaaccaa tgcttgtggt ttctgccaag atggaatatt 360
cctccttctt aanttccaca catggccggt tgcaatgctc gacagcattg cactgggctg 420
cttgtctctg tgggtctgggc accagtagct tgggccccat atacacttct cagtccccac 480
anggcttatg gccnangggc angctccaat tttcaagcac cacgaaggaa g 531

```

<210> 124
 <211> 416
 <212> DNA
 <213> Homo sapien

<400> 124
 tcgagcggcc gcccgggcag gtccatctat actttctaga gcagtaaattc tcataaattc 60
 acttaccaag cccaggaata atgactttta aagccttgaa tatcaactaa gacaaattat 120
 gccaatcttg atttctcaca tatacttaga ttacacaaag ataaagcttt agatgtgac 180
 attgtttaat gtagacttat ctttaaagtt tttaattaaa aactacagaa gggagtaaac 240
 agcaagccaa atgatttaac caaatgattt aagagtaaaa ctactcaga aagcattata 300
 cgtaactaaa tatacatgag catgattata tacatacatg aaactgcaat tttatggcat 360
 tctaagtaac tcatttaagt acatttttgg catttaaaaca aagatcaaat caagct 416

<210> 125
 <211> 199
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(199)
 <223> n = A,T,C or G

<400> 125
 agcgtggcgc cggccgaggt gctttttttt tttttttttt tttttttttt gctatttctaa 60
 aggggaaggc ccttttttat taaacttgta cattttactt tccttctttc anaatgctaa 120
 taaaaaactt ttgtttatac ttaaaaaaac cataaatcan acaaacaaaa gaaacgattc 180
 caacatcact tctgngatg 199

<210> 126
 <211> 490
 <212> DNA
 <213> Homo sapien

<400> 126
 cgtgggtcgc gccgaggtcc agttgctcta agtggattgg atatggttgg agtggcacag 60
 actggatctg ggaaaacatt gtcttatttg ctccctgcca ttgtccacat caatcatcag 120
 ccattcctag agagaggcga tgggcctatt tgtttggtgc tggcaccaac tcgggaactg 180
 gcccaacagg tgcagcaagt agctgctgaa tattgtagag catgtcgctt gaagtctact 240
 tgtatctacg gtggtgctcc taagggaacca caaatcgtg atttggagag aggtgtggaa 300
 atctgtattg caacacctgg aagactgatt gacttttttag agtgtggaaa aaccaatctg 360
 agaagaacaa cctaccttgt ccttgatgaa gcagatagaa tgcttgatat gggctttgaa 420
 ccccaaataa ggaagattgt ggatcaaata agacctgata ggcaaactct aatgtggagt 480
 gcgacttggc 490

<210> 127
 <211> 490
 <212> DNA
 <213> Homo sapien

<400> 127
 cgtgggtcgc gccgaggtcg gccgaggtct ggagatctga gaacgggcag actgcctcct 60
 caagtgggtc cctgaccctt gacccccgag cagcctaact gggaggcacc cccagcagg 120

ggcacactga	cacctcacac	ggcaggggtat	tccaacagac	ctgaagctga	gggtcctgtc	180
tgttagaagg	aaaactaaca	agcagaaagg	acagccacat	caaaaaccca	tctgtacatc	240
accatcatca	aagaccaaaa	gtaataaaaa	ccacaaagat	gggaaaaaaa	cagaacagaa	300
aaactggaaa	ctctaaaaag	cagagcacct	ctcctcttcc	aaaggaaacgc	agttcctcac	360
cagcaatgga	acaaagctgg	atggagaatg	actttgacga	gctgagaaaa	gaacgcttca	420
gacgatcaaa	ttactctgag	ctacggggagg	acattcaaac	caaaggcaaa	gaagttgaaa	480
actttgaaaa						490

<210> 128
 <211> 469
 <212> DNA
 <213> Homo sapien

 <220>
 <221> misc_feature
 <222> (1)...(469)
 <223> n = A,T,C or G

<400> 128	
cgtgggtcgcg	gccgaggtgc
ttttttctnt	ttattgttac
cctctaggat	ctctagggan
gtacaagaca	ttcagngctc
nactaaaggc	tccgtctntn
agccagtcce	cgcaggcagg
atggaaagaa	gggcaacaca
aactgaggaa	cagaaaagga
	gtgtcccatg
	tcacttttga
	ccccctccc
	60
	120
	180
	240
	300
	360
	420
	469

<210> 129
 <211> 419
 <212> DNA
 <213> Homo sapien

<400> 129	
gcgtgggtcgc	ggccgaggtc
ccatgtctcaa	atccacacca
tgcagtttaa	tccagagatc
ccacgttatg	tgcatttttc
ttagttgctt	aagagttgca
tttttttctt	tgtatggtaa
ctttggtaga	cggctgctca
	agtttccttg
	gaggaactat
	ttaatagggtg
	ggttacttg
	60
	120
	180
	240
	300
	360
	419

<210> 130
 <211> 354
 <212> DNA
 <213> Homo sapien

<400> 130	
agcgtgggtcg	cggccgaggt
gaccccgag	agcacgctgt
tgatgatggg	cttatctcga
cgatctgggt	taccagccg
tcattggcgg	ggcgagagcg
agaaactagc	accacaacct
	ctcctgccgc
	acctgcccgg
	gcggcccggc
	cgaa
	60
	120
	180
	240
	300
	354

<210> 131
 <211> 474
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(474)
 <223> n = A,T,C or G

<400> 131
 cgagcggccg cccgggcagg tctggcagca gcttcctctg gaataattga cagctttgtg 60
 ctgcctgact aaaatttgaa atgacaaccg ctgaatgtaa aatgatgtac ctacaatgag 120
 agagatttag gaatactatc tgtcaatcca tagatgtaga aacaaaacaa actacagaat 180
 gaaaacaaac ttattttaaa ccaaagaaac aaatgtatcc aaaatatagt ccatgatata 240
 tttgattact agtataacca cagttgaaaa cttaaaaaaa aaaattgaca tttttgttaa 300
 tgggtactaa tggatttata aaagggttct gtttccaaag atgttattgg ggtccacata 360
 ttccttgaag acttcagcat cccaaagccc gacatcagag atactttcct ttagccattg 420
 nttcccgtaa cttgccact ccatggtgat gtgacaggct tcccttcatt agca 474

<210> 132
 <211> 474
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(474)
 <223> n = A,T,C or G

<400> 132
 ggccgagggtg gggaattcat gtggagggtca gagggtgaagc aggtgtgaga ggggtccagca 60
 gaaggaaaca tggctgccaa agtggttgag tccattggca agtttggcct ggccttagct 120
 gttgcaggag gcgtggtgaa ctctgcctta tataatgtgg atgctgggca cagagctgtc 180
 atctttgacc gattccgtgg agtgcaggac attgtggtag gggaagggac tcattttctc 240
 atcccgtggg tacagaaacc aattatcttt gactgccgtt ctcgaccacg taatgtgcc 300
 gtcactactg gtagcaaaga ttacagaat gtcaacatca cactgcgcac cctcttccgg 360
 cctgtcgcca gccagcttcc tcgcatcttc accagcatcg ganaggacta tgatgaaccg 420
 tgtgtcgccg tccatcacia ctgagatcct caagtcagtg gtggctcgct ttga 474

<210> 133
 <211> 387
 <212> DNA
 <213> Homo sapien

<400> 133
 tgctcgagcg gccgccagtg tgatggatat ctgcagaatt cggcttagcg tggctcgggc 60
 cgaggtctgc gggcccctta gcctgccctg cttccaagcg acggccatcc cagtggggga 120
 ctttccaca ctgtgccttt acgatcagcg tgacagagta gaagctggag tgcctcacca 180
 cacggcccgg aaacagcggg aagtaactgg aaagagcttt aggacagctt agatgccgag 240
 tgggcgaatg ccagaccaat gatacccaga gctacctgcc gccaaactgt tgagatgtgt 300
 gtttgactgt gagagagtgt gtgtttgtgt gtgtgttttg ccatgaactg tggccccagt 360
 gtatagtgtt tcagtggggg agaactg 387

<210> 134

<211> 401
 <212> DNA
 <213> Homo sapien

<400> 134
 ggccgcccgg gcaggtctga tgaagaacac ggggtgtgac cttgccaatg acgccaatgc 60
 tgagcggctc aagagtgttg tgggcaactt gcatcggctg ggagtcacca acaccattat 120
 cagccactat gatgggccc agttcccaa ggtgggtggg ggctttgacc gagtactgct 180
 ggatgctccc tgcagtggca ctggggtcat ctccaaggat ccagccgtga agactaacia 240
 ggatgagaag gacatcctgc gcttgtgctc acctccagaa ggaagttgct cctgagtgtc 300
 attgactctt gtcaatgcga cttcaagac aggaggctac ctggtttact gcacctgttc 360
 taccacagtg agacctctgc catggcagaa cagggggaagc t 401

<210> 135
 <211> 451
 <212> DNA
 <213> Homo sapien

<400> 135
 ggtcgcggcc gaggtctgtt cctgagaaca gcctgcattg gaatctacag agaggacaac 60
 taatgtgagt gaggaagtga ctgtatgttg actgtggaga aagtaagtca cgtgggccct 120
 tgaggacctg gactgggtta ggaacagttg tactttcaga ggtgaggtgt cgagaaggga 180
 aagtgaatgt ggtctggagt gtgtccttgg ccttggctcc acagggtgtg ctttcctctg 240
 gggccgtcag ggagctcatc ccttgtgttc tggcagggtg gggtaaccggg gtttgacact 300
 gaggagggtg acctgctggc tggagcggca gaacagtggc cttgatttgt cttttggaag 360
 attttaaaaa ccaaaaagca taaacattct ggtccttcac aatgctttct ctgaagaaat 420
 acttaacgga aggacttctc cattcaccat t 451

<210> 136
 <211> 411
 <212> DNA
 <213> Homo sapien

<400> 136
 ggccgcccgg gcaggtctga atcacgtaga atttgaagat caagatgatg aagccagagt 60
 tcagtatgag ggttttcgac ctgggatgta tgtccgcgtt gagattgaaa atgttccttg 120
 tgaatttgtg cagaactttg acccccttta cccattatc ctgggtgggt tgggcaacag 180
 tgagggaaat gttggacatg tgcaggtggg tccctttgct gcgtatttgg tgctgaggc 240
 tctgtggatt tccccctcat caatcatctt accctctcat cccccctaga tgcgtctgaa 300
 gaaacatctc tgggtataaga aaatcctcaa gtcccaagat ccaatcatat tttctgtagg 360
 gtggagggaag tttcagacca tcctgctcta ttatatccga agaccacaat g 411

<210> 137
 <211> 211
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)... (211)
 <223> n = A,T,C or G

<400> 137
 cgccgcccgg ggcaggtcgg ttggtgcggc ctccattgtt cgtgttttaa ggcgccatga 60
 ggggtgacag aggccgtggt cgtgggtggc gctttggttc cagaggaggc ccaggaggag 120

ggttcaggcc ctttgcacca catatcccat ttgacttcta tttgtgtgaa atggcctttc 180
 cccggntcaa gccagcacct cgatgaaact t 211

<210> 138

<211> 471

<212> DNA

<213> Homo sapien

<400> 138

gccgccccggg cagggtctggg ctggcgactg gcattccaggc cgtaactgca aatctatgct 60
 aggcgggggtc tcccttctgt gtgttcaagt gttctcgact tggattctta actattttta 120
 aaaatgcact gagtttgggt taaaaaccaa ccacaaaat ggatttcaac acagctctaa 180
 agccaagggc gtggccggct ctcccaacac agcgactcct ggaggccagg tgcccatggg 240
 cctacatccc ctctcagcac tgaacagtga gttgattttt ctttttacia taaaaaaagc 300
 tgagtaatat tgcataggag taccaagaaa ctgcctcatt ggaaacaaaa actattttaca 360
 ttaataaaaa agcctggccg caggctgcgt ctgccacatt tacagcacgg tgcgatgcac 420
 acggtgacca aaccacggag gcaagcttct ggcaactcaca ccacgacctg c 471

<210> 139

<211> 481

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(481)

<223> n = A,T,C or G

<400> 139

gtcgcggccg aggtctgttc tttagctcag atttaaacct gctgtctctt ctttatttgc 60
 agaatgaatt cccagttcct gagcagttca agaccctatg gaacgggcag aagttggtca 120
 ccacagtgc agaaattgct ggataagcga agtgccactg gggtctttgc cctcccttca 180
 caccatggga taaatctgta tcaagacggg tcttttctag atttcctcta cttttttgct 240
 cttaaaaactg cttctctgct ctgagaagca cagctacctg ccttctactga aatatacctc 300
 aggtctgaaat ttgggggtggg atagcaggtc agttgatctt ctgcaggaag gtgcagcttt 360
 tccatatcag ctcaaccacg ccgncagtc attcttaagg aactgccgac taggactgat 420
 gatgcatttt agcttttgag cttttggggg gtattctacc aaccaacagt ccatttggaa 480
 a 481

<210> 140

<211> 421

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(421)

<223> n = A,T,C or G

<400> 140

gtcgcggccg aggtttccca ttttaagaaa atagatcttg agattctgat tcttttccaa 60
 acagtcccct gctttcatgt acagcttttt ctttacctta cccaaaattc tggccttgaa 120
 gcagttttcc tctatggctt tgcttttctg attttctcag aggtctcgagt ctttaataata 180
 accccaaatg aaagaaccaa ggggaggggt gggatggcac ttttttttgt tggctctgtt 240
 ttgttttgtt ttttggttgg ttgggttccg ttatttttta agattagcca ttctctgctg 300

41

```

ctatttccct acataatgtc aatttttaac cataattttg acatgattga gatgtacttg      360
aggctttttt gntttaattg agaaaagact ttgcaatttt ttttttagga tgagcctctc      420
c                                                                           421

```

```

<210> 141
<211> 242
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(242)
<223> n = A,T,C or G

```

```

<400> 141
cgantngccc gcccgggcan gtctgtctaa nttnttcang gaccacgaac agaaactcgt      60
gcttcaccga anaacaatat cttaaaccatc gaanaattta aatattatga aaaaaaacat      120
tgcaaaatat aaaataaata nnaaaaggaa aggaaacttt gaaccttatg taccgagcaa      180
atccaggtct agcaaacagt gctagtccta nattacttga tntacaacaa cacatgaata      240
ca                                                                           242

```

```

<210> 142
<211> 551
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(551)
<223> n = A,T,C or G

```

```

<400> 142
agcgtgggtcg cggcncgang tccacagggc anatattctt ttagtgctctg gaattaaat      60
gtttgaggtt tangtttgcc attgtctttc caaaaaggcca aataattcan atgtaaccac      120
accaagtgca aacctgtgct ttctatttca cgtactgttg tccatacagt tctaaataca      180
tgtgcagggg attgtagcta atgcattaca cagtcgttca gtcttctctg cagacacact      240
aagtgatcat accaacgtgt tatacactca actagaanat aataagcttt aatctgaggg      300
caagtacagt cctgacaaaa gggcaagttt gcataataga tcttcgatca attctctctc      360
caaggggccc gcaactaggc tattattcat aaaacacaac tgaanagggg attggtttta      420
ctggtaaatac atgtgntgct aaatcatttt ctgaacagtg gggctctaat cantcattga      480
tttagtggca gccacctgcc cggcggccgn tcgaagccca attctgcaga tatccatcac      540
actggcggcc g                                                                           551

```

```

<210> 143
<211> 515
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(515)
<223> n = A,T,C or G

```

```

<400> 143
cgagngggccc gcccgggcag gtatcttcac aaactcaaca aaggcactac atgagacttc      60

```

```

acattccccct agtccaatag ctgacaaatt tttgcaacgt tctgcaatgc gaattaactc 120
ttcatcaagt ggccgtaatc catttgcaca cactactagt tcaaccagtc tagggcatgt 180
cattcccaca cggccaagca catctttgct tactgatctc ccaaagtaca gatgggtggc 240
aggtatttca tagcgaaaga aggggtcaaa ttctttcttca tataanaaaa aatacatcac 300
taagttcact ttgggtgaat gtctgatgaa agcatcccag ctactcttct gaatagtatg 360
gaagtgtgtc tgtccaggat tctcactgac tacatcaatg cgcaaagtgt ctaatcgaac 420
atgtttttca gaagacaatg caagtaacaa ctcatcactc aataagtggt aagttcaggg 480
ctagttctct taagccgnga cactgatcag cacac 515

```

<210> 144

<211> 247

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (247)

<223> n = A,T,C or G

<400> 144

```

tgcattctct ntggatgcan acctgcccgt tggtagggac tntgctcaca cggaacatgg 60
acggttacac ctgtgccgtg ggtgacgtcc accagcttct ggatcatctc ggcgnnggtg 120
ttgtggaagg gcagactatc cacctccatg cncacgatgc ccganacgcc actccggact 180
ntgtgctgca ccaanatgcc cagcattnta tcttcaagca naggacttat cagggtcctt 240
ggcacac 247

```

<210> 145

<211> 309

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (309)

<223> n = A,T,C or G

<400> 145

```

cgtgggtcgc ggcccgangt ctgctgtaac aaaacaccat agtctgggca gctcatagac 60
aatggaattt tatttctcac gcttctggag gctggattcc aagatcaagg ttccaggaga 120
ctcagtgtct ggcaagggtct cggtttctgc ctcanagatg gtgccatctg gctgtgtcct 180
cacaagtaagg aaggtgcaag aagctcccct caggctctgt ctgtaagaca ctgatcccat 240
tcatganggg gaaacgtaat gacctaata gccccagag accccacttc taacaccatc 300
accttgggg 309

```

<210> 146

<211> 486

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (486)

<223> n = A,T,C or G

<400> 146

43

```

agcgtggggtc gcggnccgac gtcctgtcca tatttcacag cccgagaact aatacaagat      60
gctgacatca tattttgtcc ctacaactat cttctanatg cacaaataag ggaaagtatg      120
gatttaaadc tgaaagaaca ggttgtcatt ttanatgaag ctcataacat cgaggactgt      180
gctcgggaat cagcaagtta cagtgtaca gaagttcagc ttcggtttgc tcgggatgaa      240
ctanatagta tggccaaca taatataagg aaganagatc atgaacccct acgagctgtg      300
tgctgtagcc tcatttaattg gntagaagca aacgctgaat atcttgnana angagantat      360
gaatcagctt gtaaaatatg gagtggaaat gaaatgctct taactttaca caaaatgggt      420
atcaccactg ctacttttcc ctttttgcng gtaagatatn ttttctacct gngaaacgta      480
tttaag                                         486

```

```

<210> 147
<211> 430
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(430)
<223> n = A,T,C or G

```

```

<400> 147
gccgcccggg cangttcgac attacntnga gttccatgat gtacaattct ttcacgaaaa      60
acaatgaatg caagaatttg aggatctcct tactcctccc ttttacagat ggtctctcaa      120
tcccttcttc ttctcttcca tcttcattct cttctgaacg cgctgccggg taccacggct      180
ttctttgtct ttatcgtgag atgaagggtga tgcttctgtt tcttctacca taactgaaga      240
aatttcgctg caagtctctt gactggctgt ttctccgact tcgcctttnt gtcaaacngg      300
agtcttttta cctcatgccc ctcagcttca cagcatcttc atctggatgt tnatttctca      360
aagggctcac tgaggaaaact tctgattcan atgtcgaana gcactgtyaa gttttctctt      420
cattttgctg                                         430

```

```

<210> 148
<211> 483
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(483)
<223> n = A,T,C or G

```

```

<400> 148
cccgggcagg tctgtgttgn tttncaccg gtgtcctccc cagcgtccag aananggaaa      60
tgtggagcgg gtgatgatga cccctcgctg tctgtcacc tctgcacag cttegtatgt      120
gggtctggtc tgggaccacc cgtacaggtt gtgcacgttg tagtgtcca cgggggagct      180
gtccggcagg atctgctgac tctccatgca cagagtcttg ctgctcaggc ccttgtccct      240
agattccaaa tatggcatat aggggtgggt tatttagcat ttcattgctg cagcccctga      300
cagatccatc cacaaaattt gatggctcat tcatatcaat ccacaatcca tcaaacttca      360
agctcttctc tggntctcga nggtttgcat agaactcttc tatctcttcc ttccaccacg      420
canacctcgg ncgcgaccac gctaagccga attctgcana tatccatcac actggcggcc      480
gct                                         483

```

```

<210> 149
<211> 439
<212> DNA
<213> Homo sapien

```

<220>
<221> misc_feature
<222> (1)...(439)
<223> n = A,T,C or G

<400> 149
ctttcacgaa nacaatgaat gcaagaatTT gaggatctcc ttactcctcc cttttacaga 60
tggtctctca atcccttctt cttcctcttc atcttcatct tcttctgaac gcgctgccgg 120
gtaccacggc tttctttgtc tttatcgtga gatgaagggtg atgcttctgt ttcttctacc 180
ataactgaag aaatttcgct gcaagtctct tgactggctg tttctccgac ttgcgcctttt 240
tgcaaacgtg agtcttttta cctcatgccc ctcagcttcc acagcatctt catctggatg 300
ttcatttctc aaagggtcca ctgaggaaac ttctgactca catgtcgaag aagcactgng 360
agtttctctt catttgctgc aaanttgctc tttgctgggt gngctctcag accacccatt 420
tggtgcatg ggggctgac 439

<210> 150
<211> 578
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(578)
<223> n = A,T,C or G

<400> 150
ggcncgcccc ggcangtcca ctccactttt gagctctgag ggaatacctt caggagggac 60
agggtcaggg agtcctggca gctccgcagc agagattcac attcattcag agacttggtg 120
tccagtgcaa tgccattgat cgcaacgata ctgtctccca cagcaagggg ccttctctta 180
gcggcagggc ttccaggcag cacagcggca gcatacactc cattctccag actgatgcca 240
ctgtctttct gtccactgan gttgatgtgc agcggcgtga ccaccttccc acccagggac 300
ttcctccgcc gcacgaccat gttgatgggc cccctnccca ttgaggagcg ccttgatggc 360
ctgcttcttg nccttggtga tgaagtccac atcggtgatt ctcacagcca gtcattgacc 420
cttaagcggg catcagcaat gcttcttttg gccactttag ngacaaatat gccacagtcc 480
ccgggaaaca agggtcattc acaccttctg gcataatcaa cacctcggcc gggancacta 540
agccgaattc tgcagatatc catcacactg gngggccg 578

<210> 151
<211> 503
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(503)
<223> n = A,T,C or G

<400> 151
cgagcggccc gcccgggcag gtctgggaga tcagcgactg ctgccacgtg cccagaaatg 60
gtctgtcctt tcaactacagc ggaatgcaat gagggtgggt gagaagatga tgggtcgggt 120
atttcattcc ttttctttt acaacttcac tttcagagac ttcagcgttc catgtctgct 180
gtgctgtgga acccagagtg ctcttgcttg gatggctgag aatcccttgg accctggaag 240
cacctactcc atgatggccc ggtatagtgc aggtcaata taatcttccc ggtatcttga 300
gttgataact cgttgccgtt tcttttcttg cttaacctct ttctctgtga aaatctcatt 360

45

```

gaagcgcacg tctgaagcta ctgacagtct anatttgact ctcttgggaa gctcttcac 420
cagtgtgtat acatcatctc tcttaaccac aagttggagc catncttaaa cttcacctgg 480
tacatttggg tagggtggga ggc 503

```

```

<210> 152
<211> 553
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(553)
<223> n = A,T,C or G

```

```

<400> 152
agcgtggtcg cggcccagag tccactgagc tccgccttcc ccgggctccc tgaggaagca 60
gagtcctgac ttccaggaag gacaggacac agaggcaaga actcagcctg tgaggctctg 120
ggtggctcct gaggccagag gacgccttcc gcgatccatg gctcagcatc gtccttctgg 180
cttcccagcc ccgggccgaa cggttcgggtt aataagcaga gcagttattc ggctcctggc 240
aggagctccc ccgttagttt ccacgttggtg agcacattca tacttaagac tgnttctctt 300
tgtgttttaa gcgtctgtct ctgtagtaaa ctgaaatgtt aacagaaatg cagacctgcc 360
cggggggccg ctcgaaagcc gaattctgca gatatccatc acactggcgg ccgctcgagc 420
atgcatctag anggcccaat tcgccctata gtgagtcgna ttacaattca ctgggccgcg 480
ntttacaacg tcgtgactgg gaaaaccctg cggtagccac ttaatcgctt tgcagnacat 540
ccccctttcg cca 553

```

```

<210> 153
<211> 454
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(454)
<223> n = A,T,C or G

```

```

<400> 153
tcgagcggct cgcccgggca ggtccaccta gcatggctcc tctaaacacg caactcagcg 60
aggggacccc cttcacctct ggcaagagag ctgggtagat cagaaaactg gtgacacctg 120
gctagcacag agcaggctca cttgtcttgg tcccactacc cagattcctg cagacattgc 180
aaaccaaagt aagggtgntg aatgaccctt gtccccagcc acttggtttg gtatcatctg 240
ctctgcagtg gaatgcctgt gtgtttgagt tcactctgca tctgtatatt tgagtataga 300
aaccgantca agtgatctgt gcatncagac acactggggc acctgancac agaacaaatc 360
accttaacga tctggaatga aactgnganc antgccgccc tgggtgggtc tgganaaact 420
gccncttct tgttgacct tggccgcacc acct 454

```

```

<210> 154
<211> 596
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(596)
<223> n = A,T,C or G

```

```

<400> 154
agcgtggtcg cggcccgang gcggcctcct gantganggg aagggacgtg ggggcgggcca    60
cggcaggatt aacctccatt tcagctaata atgggagaga ttaaagtctc tcctgattat    120
aactgggtta naggtacagt tccccttaaa aagattattg tggatgatga tgacagtaag    180
atatgggtcg tctatgacgc gggcccccga agtatcaggt gtctctcat attcctgccc    240
cctgtcagtg gaactgcaga tgtcttttct cggcagattt tggctctgac tggatggggg    300
taccgggtta tcgctttgca gtatccagtt tattgggacc atctcgagtt cttgtgatgg    360
attcacaaaa cttttanacc atttacaatt ggataaagtt catctttttg gcgcttcttt    420
gggangcttt ttggccana aatttgctga atacactcac aaatctccta gaagccattc    480
cctaatactc tgcaattcct tcagngacac ctctatcttc aaccaacttg gactggaaac    540
agctttgggt gatgcctgca tttatgctca aaaaatagtt cttggaaatt ttcatac    596

```

```

<210> 155
<211> 343
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(343)
<223> n = A,T,C or G

```

```

<400> 155
ctcgantttg cncgcccggg cangtctgcc tggtttttga ccgngcgagc tatttagtct    60
ctggctctgt ttccggagct caaggnaaaa atcttgaana actcgagcag cttctgtgga    120
tagccttggg tacacatact gccgagcata gccaatgtac tttctcaata gctggtgggg    180
aatgggatct attgtttctc caggaaccac ctttagtctt tctgataatg gcttctcaga    240
aactacttca agtacggaag tatttgaatc ttgactatnc atacgagcta ctgtggcact    300
gctaattgggn tctctgctnt ccagctctta ttgcaatcac atg                    343

```

```

<210> 156
<211> 556
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(556)
<223> n = A,T,C or G

```

```

<400> 156
tcgagcggcc cgcccgggca ggtctggcac cacncagatc gattaactgg ctcatctgat    60
ctcgtggccc ccaccctgga actgacttag cacaaaagga cacctcaatt ctttatgatt    120
tcctctccga cccaaccaat caacaccctt gactcactgg ctttccccct cccaccaa    180
tatccttaaa aactctgata cccgaatgct cagggagatc gatttgagta ctaataagac    240
tccagctctc tgcacaagca gctctgtgta ctcttctctc attgcaattc ctgtcttgat    300
aaatcggctc tgtgtagcg gcggaagaag tgaacctgtt gggcggttac cacctctgtc    360
gtgtgtgaca gttgnnttga atctctaatt gctcagtaca gatccacatg cagggttaag    420
aagaagcttt tgaagaaaat ggaaagtctt aagtgatggc ttccaagaaa tcaaacctac    480
attaattagg gaacaacgga ctttacgtat cacaaatgaa gagactgacn aagtaaatca    540
acttggcctt ttctta                    556

```

```

<210> 157
<211> 333

```

<212> DNA
 <213> Homo sapien
 <220>
 <221> misc_feature
 <222> (1)...(333)
 <223> n = A,T,C or G

<400> 157
 ggccacaaa aatatatnaa ataagctgga tatataaaan caaacactta acatngncan 60
 cattccttca gttattcaaa ctcactgata nctaacnggg agnagttggn attctggaag 120
 acttcctaag ctaaaagtat atttacatat ttacaacaca ngtaaataata acngaagaac 180
 tacttcaaat aangnngaaa ttccagaatt ctanagattt atagctatag ntnacaanta 240
 tcaccaattg gtttgcaatc aanngnccag cactacttat gannaangtt taactannaa 300
 accaaaaggg gagaaaacct ggnagggaaa nat 333

<210> 158
 <211> 629
 <212> DNA
 <213> Homo sapien
 <220>
 <221> misc_feature
 <222> (1)...(629)
 <223> n = A,T,C or G

<400> 158
 tcgagcggcc gcccgggcag gtctggtaca tttgtgagag gtccggcact ctgtttctcat 60
 ccagtaagtg ttcgagccct ttctgcagaa ttgctgttaa atgttctcct aatagctgtt 120
 tctccacaca agcaatcagt ggttttctgtg tgctgtggtc caagtaagt attactctgt 180
 ctccctcttc ttctaagcgt ttacttacat ggtaagata ttctggaacc tctctttcct 240
 gcattaacct ttggccttcg gcagcatata agcaattagt ctcttccaaa aatttcagtt 300
 caaatgaatc tttatacacc tgcaggtcag acagcatgcc caggagggt ccgcaacagg 360
 ctccggtcca cggcctcgcc gctcctctcg cgctcgatca gcagtaggat tccatcaatg 420
 gttttactct gaaccatttt atcactaata atatgggttc taaacagttc taatcccata 480
 tcccagatgg agggcagcgt ggagttctgc agcacatagg tgcggtccaa gaacaggaag 540
 atgcttctga tcatgaatca tttgnctggc aatggctctg ccagcacgtg gtaatctttc 600
 ttttaaaaat aaacccttat ctaaacgtc 629

<210> 159
 <211> 629
 <212> DNA
 <213> Homo sapien
 <220>
 <221> misc_feature
 <222> (1)...(629)
 <223> n = A,T,C or G

<400> 159
 tcgagcggcc gcccgggcag gttctagagg ganaatctgg ctgatttggg aataaaatat 60
 aatcgaaat tcaacacat gaagataaat cttattttgg aaatctactg accttaatac 120
 cccaagcttg ccctgaatac tttgattgga attggaatat atcaaaaaag gttagtattt 180
 ttgtttagt taggatacta aaaggatatt agttacccaa gagatccaat ttgtttttct 240
 gatgaatagt gttcagtaaa atgaagcagt cttgaagagt actaataatt tcaaagtgat 300

```

ttttcgtcta ttcttaatat tttttaatta tttatnttta agagtnttat accttgagca      360
gatacaatga tccgcttttag tgagaggaca atttctgatt gattgttttc tcttcaggcc      420
atctcacctc ttcattctct tgttacattt gaagcagttg atataatggg tttatacttt      480
aaaagataga catggtgcca tgaagtttgg ggaagttggg tgaattatcc cattctagtt      540
accagangagc tttccttaaa tgccctttac ttctangttt ggtcaagaag tcattttctg      600
agtaaaagtt attttcatat atgttgggg      629

```

<210> 160

<211> 519

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(519)

<223> n = A,T,C or G

<400> 160

```

tcgagcggcg cgcccgggca ggtctgctgg gattaatgcc aagtntttca gccataaggt      60
agcgaaatct agcagaatcc agattacatc cactttccaat caccggtgt ttgggtaatc      120
cacttagttt ccagataaca tacgtaagaa tgtccactgg gttggaaacc acaattatga      180
tgcaatcagg actgtacttg acgatctgag gaataatgaa tttgaagaca ttaacatttc      240
tctgcaccag attgagccga ctctcccctt ctgtctgacg gactcctgca gttaccacta      300
caatcttana attgggcggg tcacagaata atctttatct gccacaattt taggtgctga      360
agaaataagc tcccatgctg cagatccatc atttctnctt taagcttatc ttccaaaaca      420
tccacaagan caangttcat cagccagaga ctttcccaga atgctgatag nacacgccat      480
accaacttgt ccaacancca ctacagcgat cttattggt      519

```

<210> 161

<211> 446

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(446)

<223> n = A,T,C or G

<400> 161

```

cgagnggccc gcccgggcag gtccagtaag cntttnacga tgatgggaaa ggttatgcaa      60
gggtcccagcg gtacaacgag ctgtttctac atcatttgta ttctgcatgg tacgtacaat      120
agcagacacc atctgaggag aacgcatgat agcgtgtctg gaagcttcct ttttagaaag      180
ctgatggacc ataactgcag cttattaac caccacctgg tcctcgtcat ttagcagttt      240
tgtcagttca gggattgcac gtgtggcang ttctgcatca tcttgatagt taatcaagtt      300
tacaactggc atgtttcagc atctgcgatg ggctcagcaa acgctggaca ttantgggat      360
gagcagcatc aaactgtgta natgggatct gcatgccctc atctaattgtc tcagggaaca      420
tagcagctcg taccctctga gctcga      446

```

<210> 162

<211> 354

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(354)

<223> n = A,T,C or G

<400> 162

agcgtngtcg	cggcccgang	tcctgggaag	cctttnttgc	tgagcctcac	agcctctgtc	60
aggcggctgc	ggatccagcg	gtccaccagg	ctctcatggc	ctccgggctg	ggaggngggg	120
gagggcacaa	aacccttccc	aaggccacga	anggcaaact	tggtggcatt	ccanagcttg	180
ttgcanaagt	ggcggnaacc	cagtatecgg	ttcacatcca	ggntgatgtc	acgaccttgg	240
gacatgtang	cacataatcc	aaaccggaga	gcacgggtgc	cacattcacg	aatccccgct	300
gggaagtcag	ctttctgccc	ttctttggcc	ttctccacct	cgctgggata	cagg	354

<210> 163

<211> 258

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(258)

<223> n = A,T,C or G

<400> 163

tttttcncca	agtcctcttg	ccgngggatc	tngactgcaa	tttaagacac	ttctaattag	60
ttataccag	gccctgcaaa	attgctgggt	ttatataata	tattcttgct	gcacgaagat	120
ttattattct	gttgatgat	tctattttta	ttntatttat	tctggccaaa	aaagaacctt	180
ctcgcctcgt	caagagangc	caatntgtct	tgaaggacaa	gagaaagatg	ctaacacaca	240
ctttcttctt	cttgagga					258

<210> 164

<211> 282

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(282)

<223> n = A,T,C or G

<400> 164

ggaacatatt	acttttaaat	tacttgggtc	aatgaaacat	ttaataaaaa	catttgcttc	60
tctatataat	acgtatgtat	aaaataagcc	ttttcanaaa	ctctggttct	cataatcctc	120
tataaatcan	atgatctgac	ttctaagagg	aacaaattac	agnaaggggt	atacattnat	180
gaatactggt	agtactagag	ganngacgct	aaaccactct	actaccactt	gcggaactct	240
cacagggtaa	atgacaaaagc	caatgactga	ctctaaaaac	aa		282

<210> 165

<211> 462

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(462)

<223> n = A,T,C or G

<400> 165
 gcccgggcan gtcctgtaat cccagctact cangangctg agtcatgana atcgccctgaa 60
 tccgggaggt agaggccgca gcgagcaaag attaagccac tgcactccag tctgggtgac 120
 agagtgaagaa tctgtctgtt gtcctctctg cattgggtctg aaatgggttt gtagaacatg 180
 ccacagaagg accagcanca gcaacaaatg gatttgtgga ancgtagct ccaaaggag 240
 cangcacact tgatgaagca cgctgtgtct gtgcagangc aaccactggc actgttccaa 300
 aaacattgct gctagcatta cttgtggaag tatacgcat actggagggtg gctgcanaac 360
 tgaaaacgct gtctagtctt gccanagctg catacttgnc tgaanatgca cttgactgac 420
 tgggaactga accacanaac caacaggacc tttacctgtg ga 462

<210> 166

<211> 365

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(365)

<223> n = A,T,C or G

<400> 166
 cgtgggtcgc ggcncgangt ctgaaaccaa tccagaacta aacatcagca cacaaaaaat 60
 accaggatag atggaatcaa aagactctga agccaaaagg aggctaggga gagcaactga 120
 acttagcaag ctgaggactt cagtgtccat catccgatcc tgcctgttaa caacaggtct 180
 atatgataga gatattccat ctgagctgga ggccattatc cttagcaaac taacacagaa 240
 cagaaaacca aatacatgtt ctcatctaga agtaggagct aaatgatgag aactcaagga 300
 cacaaagaaa ggaacaacag acactggggc ctacttgagg gtggaggggtg ggaggaggga 360
 gaaga 365

<210> 167

<211> 364

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(364)

<223> n = A,T,C or G

<400> 167
 agcgtggtcg cggcgcgang tccagcccta gcttgctgt gactccgcct tctctgggtg 60
 ctctctctaa aagttgctga ctctttactg tatctcccaa tcccactcc attggttcca 120
 taaggggagg ggtgtctcac tcaacatggt gttcctggta ccaagaactg gctgacgaag 180
 ctgggtgccg tggctcatgc ctgtaatccc agcacttttg ggaggccaag aagggcggat 240
 cacctgaggt ctggagtcca agatcagcct gaccaacatg atgaaaccaa gtctccacta 300
 aaaatataaa acaattagcc aggcattggt gtgggtgcct gnaatcccag ctactgggga 360
 ngct 364

<210> 168

<211> 447

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(447)

<223> n = A,T,C or G

<400> 168

```

ccccgggcagg tcaaaaccca aaacctttca ttttagccca aaccagctca tgattaggta      60
tacaaggata acagaaccag ttgtcaggac gagcatttga caagtaaaag caattcttgc      120
aaagctgcag ttcattccagc tcatggcatg tgtctttata tagcatcctc gcaatgtcag      180
cttgcactact gtctgctcca tagaaaatca cggatttgtg gagaagcaat tgggcatcag      240
ctttgaactc ttcataactt cggattttcc cttcattcac tttctcttga atgggtgggaa      300
cgtccacaga cctcggccgc gaccacgcta agcccgaatt ctgcagatat ccatcacact      360
ggcggccggt cgagcatggc atctagaagg cccaattcgc ctatagngag tcgnattacc      420
aattcactgg ccgtcgnntt acaacgc                                     447

```

<210> 169

<211> 524

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(524)

<223> n = A,T,C or G

<400> 169

```

cgantngcgc gcccgggcag gtctgagcag cctttctggn tgctggacta ttgggattgg      60
gttcatccaa cagagactgt atggatgtta gaatggaaga cacatcatag gttggactcc      120
aacggttctg aagtatgtcc agacatatac taccatctgc atagactaag aacaaagaag      180
taggtacatt aaacgtaaca agaccactaa ggttttaaca ttatagacaa aacanaaata      240
gtcaaganta ctttgctttt gaagttaaaa gattcctatg ttgcttccca gtttaactgcc      300
taaaaagata agncataaacc accactagtg aaataatcan gatgatcaga gaatgtcana      360
tgtgatcagt ataaaactgg angatattna gtgtcatcct ttggaaaagg ctgccctatn      420
atccaggaaa tcanaaacat tnttgaaacag ggnccctagc tatccacaga catgtgggaa      480
attcattccc caaatngtag gctggatccc ctatctgaaa taac                                     524

```

<210> 170

<211> 332

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(332)

<223> n = A,T,C or G

<400> 170

```

tcgancggcn cgcccgggca ggtgacaaac ctgttattga agatgttggg tctgatgagg      60
aanaanatca gaagggatgg tgacaagaan aanaanaaga agattaagga aaagtacatc      120
gatcaagaag agctcaacaa aacaaagccc atctggacca gaaatcccga cgatattact      180
aatgangagt acggagaatt ctataanagc ttgaccaatg actgggaaga tcacttggca      240
gtgaagcatt tttcagttga nggacagttg gaattcagag cccttctatn tgtcccacga      300
cgtgctcctt ttgatctgtt tganancaga aa                                     332

```

<210> 171

<211> 334

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(334)

<223> n = A,T,C or G

<400> 171

cgagngggcnc	gcccgggcag	gtctgttgat	agcgacttaa	cagaaaagtc	tagacaaaca	60
taagcataaa	aaattacagt	ctttctaccc	ttgggaatgg	ggagaaaaag	gaatctctac	120
cccaagacca	gaaataataa	gtcctgtttc	tggtcctgaa	catccagaat	tatggaggct	180
ttggcctgac	accacattan	aatttgggtct	ggaaatcaaa	ctttaganac	angagatcgt	240
aagccatttt	atactatcga	cctaaattcc	agtctaacgg	ttcctttaca	aagttgcgga	300
aagccctctt	atatgctagc	tgtaggaaat	atag			334

<210> 172

<211> 439

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(439)

<223> n = A,T,C or G

<400> 172

agcgtgggtcg	cggcccgang	tctgcctata	aaactagact	tctgacgctg	ggctccagct	60
tcattctcac	aggatcatcat	cctcatccgg	gagagcagtt	gtctgagcaa	cctctaagtc	120
gtgctcatac	tgtgctgccca	aagctgggtc	catgacaact	tctgggtggg	cgagagcagg	180
catggcaaca	aattccaagt	tagggctctc	aatgagcttc	ctagcaagcc	agaggaaggg	240
cttttcaaa	ttgtagttac	ttttggcaga	aatgtcgtag	tactgaagat	tcttctttcg	300
gtggaagaca	atggatttcg	ccttcacttt	ctgccttaat	atccactttg	gtgccacaca	360
acacaatggg	gatgntttca	cacacttngn	accanattct	tatgccagnt	aggccatttt	420
ggaagnactt	cganggtac					439

<210> 173

<211> 599

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(599)

<223> n = A,T,C or G

<400> 173

cgatngggccg	cccgggcagg	tcctgtaaaa	naggaaattc	agacatcgta	cgactcgtaa	60
ttgaatgtgg	agctgactgc	aatattttgt	caaagcacca	gaatagtgcc	ctgcactttg	120
cgaagcagtc	taacaatgtg	cttgtgtacg	acttgctgaa	gaaccattta	gagacacttt	180
caagagttagc	agaagagaca	ataaaggatt	actttgaagc	tcgccttgct	ctgctagaac	240
cagtttttcc	aatcgcatgt	catcgactct	gtgaggggtcc	agatttttca	acagatttca	300
attaccaacc	cccacagaac	ataccagaag	gctctggcat	cctgctgttt	atcttccatg	360
caaacttttt	gggtaaagaa	gttattgctc	ggctctgtgg	accgtgtagt	gtacaagctg	420
tagttctgaa	tgataaattt	cagcttcctg	ttttctctgg	tctcgctctg	ttgtccaggc	480
tggagtgcag	tggcgcggat	tacagctcac	tggagtcttg	acttcccagg	cacaagcaat	540

cctccccacct cagcctccta actacctggg actaaaaatg caccgccacc acattccgg 599

<210> 174

<211> 458

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(458)

<223> n = A,T,C or G

<400> 174

tcgatttggc	cgcccgggca	ggtccatgcn	gnttntgccc	attcccatgg	ngcccgacaa	60
ncccatcccc	gaggccgaca	tccccatggt	catgttcatg	cccaccatgc	cctgggtcat	120
ccctgcgctg	ttccccagag	gggccattcc	catggtgccc	gtcattacac	cgggcatggt	180
cataggcatg	ggtcccccca	ggagaggggt	agnttgaggc	cggacaggaa	gcatgtttga	240
tggagaactg	aggttcacag	nctccaaaac	tttgagtcac	cacattcata	ggctgctgca	300
tattctgtct	gctgaatcca	ttgtatncag	tgatggcctg	ctggggnttt	ggaaggctng	360
cataccaggt	agtaagntcg	tctaggctga	tgtttacacc	tggggtcaga	ccaagtanga	420
gggcaagggt	ttgctgactg	attttctgga	cccatatc			458

<210> 175

<211> 1206

<212> DNA

<213> Homo sapien

<400> 175

ggcacgagga	agttttgtgt	actgaaaaag	aaactgtcag	aagcaaaaga	aataaaatca	60
cagtttagaga	accaaaaagt	taaaatgggaa	caagagctct	gcagtgtgag	gtttctcaca	120
ctcatgaaaa	tgaaaattat	ctcttacatg	aaaattgcat	gttgaaaaag	gaaattgcc	180
tgctaaaact	ggaaatagcc	acactgaaac	accaatacca	ggaaaaggaa	aataaatact	240
ttgaggacat	taagatttta	aaagaaaaga	atgctgaact	tcagatgacc	ctaaaactga	300
aagaggaatc	attaactaaa	agggcatctc	aatatagtg	gcagcttaaa	gttctgatag	360
ctgagaacac	aatgtctact	tctaaattga	aggaaaaaca	agacaaagaa	atactagagg	420
cagaaattga	atcacaccat	cctagactgg	cttctgctgt	acaagaccat	gatcaaattg	480
tgacatcaag	aaaaagtcaa	gaacctgctt	tccacattgc	aggagatgct	tgtttgcaaa	540
gaaaaatgaa	tgttgatgtg	agtagtacga	tatataacaa	tgagggtgctc	catcaaccac	600
tttctgaagc	tcaaaggaaa	tccaaaagcc	taaaaattaa	tctcaattat	gccggagatg	660
ctctaagaga	aaatacattg	gttttcagaac	atgcacaaag	agaccaacgt	gaaacacagt	720
gtcaaagtga	ggaagctgaa	cacatgtatc	aaaacgaaca	agataatgtg	aacaaacaca	780
ctgaacagca	ggagtctcta	gatcagaaat	tatttcaact	acaaagcaaa	aatatgtggc	840
ttcaacagca	attagttcat	gcacataaga	aagctgacaa	caaaagcaag	ataacaattg	900
atattcattt	tcttgagagg	aaaatgcaac	atcatctcct	aaaagagaaa	aatgaggaga	960
tattttaatta	caataaccat	ttaaaaaacc	gtatatatca	atatgaaaaa	gagaaagcag	1020
aaacagaagt	tatataatag	tataaactg	ccaaggagcg	gattatctca	tcttcatcct	1080
gtaattccag	tgtttgtcac	gtggttgttg	aataaatgaa	taaagaatga	gaaaaccaga	1140
agctctgata	cataatcata	atgataatta	tttcaatgca	caactacggg	tgggtgctgct	1200
cgtgcc						1206

<210> 176

<211> 317

<212> PRT

<213> Homo sapien

54

<400> 175
Met Gly Thr Arg Ala Leu Gln Cys Glu Val Ser His Thr His Glu Asn
1 5 10 15
Glu Asn Tyr Leu Leu His Glu Asn Cys Met Leu Lys Lys Glu Ile Ala
20 25 30
Met Leu Lys Leu Glu Ile Ala Thr Leu Lys His Gln Tyr Gln Glu Lys
35 40 45
Glu Asn Lys Tyr Phe Glu Asp Ile Lys Ile Leu Lys Glu Lys Asn Ala
50 55 60
Glu Leu Gln Met Thr Leu Lys Leu Lys Glu Glu Ser Leu Thr Lys Arg
65 70 75 80
Ala Ser Gln Tyr Ser Gly Gln Leu Lys Val Leu Ile Ala Glu Asn Thr
85 90 95
Met Leu Thr Ser Lys Leu Lys Glu Lys Gln Asp Lys Glu Ile Leu Glu
100 105 110
Ala Glu Ile Glu Ser His His Pro Arg Leu Ala Ser Ala Val Gln Asp
115 120 125
His Asp Gln Ile Val Thr Ser Arg Lys Ser Gln Glu Pro Ala Phe His
130 135 140
Ile Ala Gly Asp Ala Cys Leu Gln Arg Lys Met Asn Val Asp Val Ser
145 150 155 160
Ser Thr Ile Tyr Asn Asn Glu Val Leu His Gln Pro Leu Ser Glu Ala
165 170 175
Gln Arg Lys Ser Lys Ser Leu Lys Ile Asn Leu Asn Tyr Ala Gly Asp
180 185 190
Ala Leu Arg Glu Asn Thr Leu Val Ser Glu His Ala Gln Arg Asp Gln
195 200 205
Arg Glu Thr Gln Cys Gln Met Lys Glu Ala Glu His Met Tyr Gln Asn
210 215 220
Glu Gln Asp Asn Val Asn Lys His Thr Glu Gln Gln Glu Ser Leu Asp
225 230 235 240
Gln Lys Leu Phe Gln Leu Gln Ser Lys Asn Met Trp Leu Gln Gln Gln
245 250 255
Leu Val His Ala His Lys Lys Ala Asp Asn Lys Ser Lys Ile Thr Ile
260 265 270
Asp Ile His Phe Leu Glu Arg Lys Met Gln His His Leu Leu Lys Glu
275 280 285
Lys Asn Glu Glu Ile Phe Asn Tyr Asn Asn His Leu Lys Asn Arg Ile
290 295 300
Tyr Gln Tyr Glu Lys Glu Lys Ala Glu Thr Glu Val Ile
305 310 315

<210> 177

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Made in the Lab

<400> 177

ccaatcatct ccacaggagc

20

<210> 178

<211> 1665

<212> DNA

<213> Homo sapien

<400> 178

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gcaaaactttc aagcagagcc tcccgagaag ccattctgcct tcgagcctgc cattgaaatg      60
caaaagtctcg ttccaaataa agccttggaa ttgaagaatg aacaaacatt gagagcagat      120
cagatgtttcc cttcagaatc aaaacaaaag aaggttgaag aaaattcttg ggattctgag      180
agtctccgtg agactgtttc acagaaggat gtgtgtgtac ccaaggctac acatcaaaaa      240
gaaatggata aaataagtgg aaaattagaa gattcaacta gcctatcaaa aatcttggat      300
acagttcatt cttgtgaaag agcaaggga cttcaaaaag atcactgtga acaacgtaca      360
ggaaaaatgg aacaaatgaa aaagaagttt tgtgtactga aaaagaaact gtcagaagca      420
aaagaaataa aatcacagtt agagaaccaa aaagttaaat gggacaaga gctctgcagt      480
gtgagggtttc tcacactcat gaaaatgaaa attatctctt acatgaaaat tgcattgtga      540
aaaaggaaat tgccatgcta aaactggaaa tagccacact gaaacaccaa taccaggaaa      600
aggaaaataa atactttttag gacattaaga ttttaaaaga aaagaatgct gaacttcaga      660
tgaccctaaa actgaaagag gaatcattaa ctaaaagggc atctcaatat agtgggcagc      720
ttaaagtctt gatagctgag aacacaatgc tcacttctaa attgaaggaa aaacaagaca      780
aagaaatact agaggcagaa attgaatcac accatcctag actggcttct gctgtacaag      840
accatgatca aattgtgaca tcaagaaaaa gtcaagaacc tgctttccac attgcaggag      900
atgcttgttt gcaaagaaaa atgaatgttg atgtgagtag tacgatatat aacaatgagg      960
tgctccatca accactttct gaagctcaaa ggaatccaa aagcctaaaa attaatctca     1020
attatgccgg agatgctcta agagaaaaata cattggtttc agaacatgca caaagagacc     1080
aacgtgaaac acagtgtcaa atgaaggaag ctgaacacat gtatcaaac gaacaagata     1140
atgtgaacaa acacactgaa cagcaggagt ctctagatca gaaattatct caactacaaa     1200
gcaaaaatat gtggcttcaa cagcaattag ttcatgcaca taagaaagct gacaacaaaa     1260
gcaagataac aattgatatt cattttcttg agaggaaaat gcaacatcat ctctaaaaag     1320
agaaaaatga ggagatattt aattacaata accattttaa aaaccgtata tatcaatatg     1380
aaaaagagaa agcagaaaca gaaaactcat gagagacaag cagtaagaaa cttcttttgg     1440
agaaacaaca gaccagatct ttactcacia ctcatgctag gaggccagtc cttagcattac     1500
cttatgttga aaatcttacc aatagtctgt gtcaacagaa tacttatttt agaagaaaaa     1560
ttcatgattt cttcctgaag cctgggcgac agagcgagac tctgctctca aaaaaaaaaa     1620
aaaaaaaaagaa agaaagaaat gcctgtgctt acttcgcttc ccagg                      1665

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<210> 179

<211> 179

<212> PRT

<213> Homo sapien

<400> 179

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Ala Asn Phe Gln Ala Glu Pro Pro Glu Lys Pro Ser Ala Phe Glu Pro
 1          5          10          15
Ala Ile Glu Met Gln Lys Ser Val Pro Asn Lys Ala Leu Glu Leu Lys
          20          25          30
Asn Glu Gln Thr Leu Arg Ala Asp Gln Met Phe Pro Ser Glu Ser Lys
          35          40          45
Gln Lys Lys Val Glu Glu Asn Ser Trp Asp Ser Glu Ser Leu Arg Glu
          50          55          60
Thr Val Ser Gln Lys Asp Val Cys Val Pro Lys Ala Thr His Gln Lys
65          70          75          80
Glu Met Asp Lys Ile Ser Gly Lys Leu Glu Asp Ser Thr Ser Leu Ser
          85          90          95
Lys Ile Leu Asp Thr Val His Ser Cys Glu Arg Ala Arg Glu Leu Gln
          100          105          110
Lys Asp His Cys Glu Gln Arg Thr Gly Lys Met Glu Gln Met Lys Lys
          115          120          125

```

56

Lys Phe Cys Val Leu Lys Lys Lys Leu Ser Glu Ala Lys Glu Ile Lys
 130 135 140
 Ser Gln Leu Glu Asn Gln Lys Val Lys Trp Glu Gln Glu Leu Cys Ser
 145 150 155 160
 Val Arg Phe Leu Thr Leu Met Lys Met Lys Ile Ile Ser Tyr Met Lys
 165 170 175
 Ile Ala Cys

<210> 180
 <211> 1681
 <212> DNA
 <213> Homo sapien

<400> 180
 gatacagtca ttcttgtgaa agagcaaggg aacttcaaaa agatcactgt gaacaacgta 60
 caggaaaaat ggaacaaatg aaaaagaagt tttgtgtact gaaaaagaaa ctgtcagaag 120
 caaaagaaat aaatcacag ttagagaacc aaaaagttaa atgggaacaa gagctctgca 180
 gtgtgagatt gactttaaac caagaagaag agaagagaag aaatgccgat atattaaatg 240
 aaaaaattag ggaagaatta ggaagaatcg aagagcagca taggaaagag ttagaagtga 300
 aacaacaact tgaacaggct ctcagaatac aagatataga attgaagagt gtagaaagta 360
 atttgaatca ggtttctcac actcatgaaa atgaaaatta tctcttacat gaaaattgca 420
 tgttgaaaaa ggaaattgcc atgctaaaac tggaaatagc cactactgaaa caccaatacc 480
 aggaaaaagg aaataaatac tttgaggaca ttaagatttt aaaagaaaaa aatgctgaac 540
 ttcagatgac cctaaaactg aaagaggaat cattaactaa aagggcatct caatatagtg 600
 ggcagcttaa agttctgata gctgagaaca caatgctcac ttctaaattg aaggaaaaac 660
 aagacaaaga aatactagag gcagaaattg aatcacacca tcttagactg gcttctgctg 720
 tacaagacca tgatcaaatt gtgacatcaa gaaaaagtca agaactgct tccacattg 780
 caggagatgc ttgtttgcaa agaaaaatga atgttgatgt gagtagtacg atatataaca 840
 atgaggtgct ccatcaacca ctttctgaag ctcaaaggaa atccaaaagc ctaaaaatta 900
 atctcaatta tgccggagat gctctaagag aaaatacatt ggtttcagaa catgcacaaa 960
 gagaccaacg tgaacacacag tgtcaaatga aggaagctga acacatgtat caaaacgaac 1020
 aagataatgt gaacaaacac actgaacagc aggagtctct agatcagaaa ttatttcaac 1080
 tacaagcaa aaatatgtgg cttcaacagc aattagttca tgcacataag aaagctgaca 1140
 acaaaagcaa gataacaatt gatattcatt ttcttgagag gaaaatgcaa catcatctcc 1200
 taaaagagaa aaatgaggag atatttaatt acaataacca tttaaaaaac cgtatataac 1260
 aatatgaaaa agagaaagca gaaacagaaa actcatgaga gacaagcagt aagaacttc 1320
 ttttgagaaa acaacagacc agatctttac tcacaactca tgctaggagg ccagtcctag 1380
 cattacctta tgttgaaaaa tcttaccaat agtctgtgtc aacagaatac ttattttaga 1440
 agaaaaattc atgatttctt cctgaagcct acagacataa aataacagtg tgaagaatta 1500
 cttgttcacg aattgcataa aagctgcccc ggatttccat ctaccctgga tgatgccgga 1560
 gacatcatc aatccaacca gaatctcgct ctgtcactca ggctggagtg cagtgggcgc 1620
 aatctcggct cactgcaact ctgcctccca gggtcacgcc attctctggc acagcctccc 1680
 g 1681

<210> 181
 <211> 432
 <212> PRT
 <213> Homo sapien

<400> 181
 Asp Thr Val His Ser Cys Glu Arg Ala Arg Glu Leu Gln Lys Asp His
 1 5 10 15
 Cys Glu Gln Arg Thr Gly Lys Met Glu Gln Met Lys Lys Lys Phe Cys
 20 25 30

Val Leu Lys Lys Lys Leu Ser Glu Ala Lys Glu Ile Lys Ser Gln Leu
 35 40 45
 Glu Asn Gln Lys Val Lys Trp Glu Gln Glu Leu Cys Ser Val Arg Leu
 50 55 60
 Thr Leu Asn Gln Glu Glu Lys Arg Arg Asn Ala Asp Ile Leu Asn
 65 70 75 80
 Glu Lys Ile Arg Glu Glu Leu Gly Arg Ile Glu Glu Gln His Arg Lys
 85 90 95
 Glu Leu Glu Val Lys Gln Gln Leu Glu Gln Ala Leu Arg Ile Gln Asp
 100 105 110
 Ile Glu Leu Lys Ser Val Glu Ser Asn Leu Asn Gln Val Ser His Thr
 115 120 125
 His Glu Asn Glu Asn Tyr Leu Leu His Glu Asn Cys Met Leu Lys Lys
 130 135 140
 Glu Ile Ala Met Leu Lys Leu Glu Ile Ala Thr Leu Lys His Gln Tyr
 145 150 155 160
 Gln Glu Lys Glu Asn Lys Tyr Phe Glu Asp Ile Lys Ile Leu Lys Glu
 165 170 175
 Lys Asn Ala Glu Leu Gln Met Thr Leu Lys Leu Lys Glu Glu Ser Leu
 180 185 190
 Thr Lys Arg Ala Ser Gln Tyr Ser Gly Gln Leu Lys Val Leu Ile Ala
 195 200 205
 Glu Asn Thr Met Leu Thr Ser Lys Leu Lys Glu Lys Gln Asp Lys Glu
 210 215 220
 Ile Leu Glu Ala Glu Ile Glu Ser His His Pro Arg Leu Ala Ser Ala
 225 230 235 240
 Val Gln Asp His Asp Gln Ile Val Thr Ser Arg Lys Ser Gln Glu Pro
 245 250 255
 Ala Phe His Ile Ala Gly Asp Ala Cys Leu Gln Arg Lys Met Asn Val
 260 265 270
 Asp Val Ser Ser Thr Ile Tyr Asn Asn Glu Val Leu His Gln Pro Leu
 275 280 285
 Ser Glu Ala Gln Arg Lys Ser Lys Ser Leu Lys Ile Asn Leu Asn Tyr
 290 295 300
 Ala Gly Asp Ala Leu Arg Glu Asn Thr Leu Val Ser Glu His Ala Gln
 305 310 315 320
 Arg Asp Gln Arg Glu Thr Gln Cys Gln Met Lys Glu Ala Glu His Met
 325 330 335
 Tyr Gln Asn Glu Gln Asp Asn Val Asn Lys His Thr Glu Gln Gln Glu
 340 345 350
 Ser Leu Asp Gln Lys Leu Phe Gln Leu Gln Ser Lys Asn Met Trp Leu
 355 360 365
 Gln Gln Gln Leu Val His Ala His Lys Lys Ala Asp Asn Lys Ser Lys
 370 375 380
 Ile Thr Ile Asp Ile His Phe Leu Glu Arg Lys Met Gln His His Leu
 385 390 395 400
 Leu Lys Glu Lys Asn Glu Glu Ile Phe Asn Tyr Asn Asn His Leu Lys
 405 410 415
 Asn Arg Ile Tyr Gln Tyr Glu Lys Glu Lys Ala Glu Thr Glu Asn Ser
 420 425 430

<210> 182

<211> 511

<212> DNA

<213> Homo sapiens

<400> 182

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gaagtttcat gaggttttagc ttttctgggc tggggagtgg agagaaagaa gttgcagggc 60
ttacaggaaa tcccagagcc tgagggtttc tcccagattt gagaactcta gattctgcat 120
cattatcttt gagtctatat tctcttgggc tgtaagaaga tgaggaatgt aataggtctg 180
ccccaagcct ttcatgcctt ctgtaccaag cttgtttcct tgtgcatcct tcccaggctc 240
tggtgcccc ttattggaga atgtgatttc caagacaatc aatccacaag tgtctaagac 300
tgaatacaaa gaacttcttc aagagttcat agacgacaat gccactacaa atgccataga 360
tgaattgaag gaatgttttc ttaaccaaac ggatgaaact ctgagcaatg ttgagggtgt 420
tatgcaatta atatatgaca gcagtctttg tgatttattt taactttctg caagaccttt 480
ggctcacaga actgcagggt atggtgagaa a                                     511

```

<210> 183

<211> 260

<212> DNA

<213> Homo sapiens

<400> 183

```

cacctcgagg ttcagctcct ctgtcttggg gaagaacccat tcctcgccat ccttgcgggt 60
cttctctgcc atcttctcat actggtcacg catctcgttc agaatgcggc tcaggtccac 120
gccagggtgca gcgtccatct ccacattgac atctccaccc acctggcctc tcagggcatt 180
catctcctcc tcgtggttct tcttcaggta ggccagctcc tccttcaggc tctcaatctg 240
catctccagg tcagctctgg                                     260

```

<210> 184

<211> 461

<212> DNA

<213> Homo sapiens

<400> 184

```

gtctgatggg agaccaaaga atttgcaagt ggatgggttg gtatcactgt aaataaaaag 60
agggcctttt ctactgtgat gactgttact tgacctctct tgaaaagcat tcccaaaatg 120
ctctatttta gatagattaa cattaaccaa cataattttt ttagatcga gtcagcataa 180
atttctaagt cagcctctag tcgtggttca tctctttcac ctgcatttta ttggtgttt 240
gtctgaagaa aggaaagagg aaagcaaata cgaattgtac tatttgtacc aaatctttgg 300
gattcattgg caaataattt cagtgtggtg tattattaaa tagaaaaaaa aaattttgtt 360
tcctagggtg aagggtctaat tgataccgtt tgacttatga tgaccattta tgcactttca 420
aatgaatttg ctttcaaaat aaatgaagag cagacctcgg c                                     461

```

<210> 185

<211> 531

<212> DNA

<213> Homo sapiens

<400> 185

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tctgatttta tttccttctc aaaaaaagtt atttacagaa ggtatatatc aacaatctga 60
caggcagtga acttgacatg attagctggc atgatttttt cttttttttc ccccaaacat 120
tgtttttgtg gccttgaatt ttaagacaaa tattctacac ggcattattg acaggatgga 180
tggaaaaaaa aagtttaaaa acaaaaaccc ttaacggaac tgcccttaaaa aggagacgt 240
cctagtgcct gtcattgtat attaaacata catacacaca atctttttgc ttattataat 300
acagacttaa atgtacaaag atgtttttcc cttttttcaa tttttaaaca caacagctat 360
aaacctgaac acatatgcta tcatcatgcc ataagactaa aacaattata ttagcgaca 420
agttagaaag attaaatagt caaatacaag aatgaaaaac gcagtacata gtgtcgcgaa 480
ctcaaatcgg catttagata gatccagtgg tttaaacggc acgtttttgc t 540

```

<210> 186
<211> 441
<212> DNA
<213> Homo sapiens

<400> 186
cattccttttc ctgcggttgg ggtttctctg tgtcagcgag cctcgggtaca ctgattttccg 60
atcaaaagaa tcatcatctt taccttgact tttcagggaa ttactgaact ttcttctcag 120
aagatagggc acagccattg ccttggcctc acttgaaggg tctgcatttg ggtcctctgg 180
tctcttgcca agtttcccaa ccactcgagg gagaaatatac gggagggttg acttcctccg 240
gggctttccc gagggcttca cctgtagccc tgcggccctc agggctgcaa tcctggattc 300
aatgtctgaa acctcgctct ctgcctgctg gacttctgag gccgtcactg ccactctgtc 360
ctccagctct gacagctcct catctgtggc cctgttgtac tggacggggc cccaggggc 420
ctgggggctt ttttctgtc t 441

<210> 187
<211> 371
<212> DNA
<213> Homo sapiens

<400> 187
aaaagtgaat gagtaactat tatattgttg gcaataataa gttgcaaaat catcaggctg 60
caggctgctg atggtgagag tgaactctgt cccagatcca ctgccgctga accttgatgg 120
gaccccagat tctaaactag acgccttatg gatcaggagc tttggggctt tccctggttt 180
ctgttgatac caggccaacc aactactaac actctgactg gcccggaag tgatggtgac 240
tctgtctcct acagttgcag acagggtgga aggagactgg gtcactctga tgtcacattt 300
ggcacctggg agccagagca gcaggagccc caggagctga gcggggaccc tcatgtccat 360
gctgagtcct g 371

<210> 188
<211> 226
<212> DNA
<213> Homo sapiens

<400> 188
ggtatataaa ttgagatgcc cccccaggcc agcaaatgtt cctttttgtt caaagtctat 60
ttttattcct tgatattttt cttttttttt tttttgtgga tggggacttg tgaatttttc 120
taaagggtgt atttaacatg ggaggagagc gtgtgcggct ccagcccagc ccgctgtctca 180
ctttccacc tctctccacc tgcctctggc ttctcaggac ctgcc 226

<210> 189
<211> 391
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(391)
<223> n=A,T,C or G

<400> 189
tgggtgaagt ttattctgtt ttcacatcta ggttggtggg ganagtgata gacaaagttc 60
tggattctgg gcatcgctgg cgcattgttg taatcctact tgggaggttg anacaggaga 120
cctcggccgc naccacgcta agggcgaatt ctgcanatat ccatcacact ggcggccgct 180
cgagcatgca tctanagggc ccaattcnc ctatagttag ncgtattaca attcactggc 240

60

```

cgtcgctttta caacgctcgtg actgggaaaa ccctggcggtt acccaactta atcgcccttg 300
agcacatccc cctttcncca gctggcttaa tancgaagag gcccgcaccg atcgcccttc 360
ccaacanttg cgcagcctga atggcgaatg g 391

```

<210> 190

<211> 501

<212> DNA

<213> Homo sapiens

<400> 190

```

catcttggcc tttttgagct gtttccgctt cttctcatcc cggtcactgt caccctcatt 60
actggaggag ctggcagagg cggttgctgtc aaactcctct gccacatctt cctcctcttc 120
acctgggttg aatgactcat cggtttcttc tcttgagtca tcgctgctgt cattggcatt 180
ctcctcccgg atcttgccct cctccttcat cctctccaag taggcatcat gctggtcctc 240
atcagagtca gcatattcat cgtagcttgg gttcatgccc tctttcaatc ctgggttttt 300
gatgttgagc tttttcgcgt tgacaaaatc aaacagtttc ccgtactcct cctctcaat 360
gctgctgaag gtatactgag tgccctgctt ggtctcaatt tcaaagtcaa aggaacgagt 420
agtagtggtg ccacgagcaa agttgacaaa ggagatctca tcgaagcgga tgtgcacagg 480
tggcttgtgg acgtagatga a 501

```

<210> 191

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (49)

<223> n=A,T,C or G

<400> 191

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ggaaaaactg tgaaaaatat atctgaattt attaagtaca gtataaaana gggttgtggc 60
aacagaaagt aaaaactaac atggattgct ataaatatgc tgaagcctag ttgttcaaat 120
gatacaattc tctcatgcta ctctaaagt tataaagaaa aaggatttac actttacaca 180
ctgtacacaa aaggaatacc ttctgagagc cagggagtgg ggaaagggga aggagacttg 240
a 241

```

<210> 192

<211> 271

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(271)

<223> n=A,T,C or G

<400> 192

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tggtcntgga ttcacanata aantanatcg actaaaactg gcagaaattg tgaagcaggt 60
gatagaagan caaaccacgt cccacgaatc ccaataatga cagcttcaga ctttgctttt 120
ttaacaattt gaaaaattat tctttaatgt ataaagtaat tttatgtaaa ttaataaatc 180
ataatttcat ttccacattg attaaagctg ctgtatagat ttagggngca ggacttaata 240
atagnggaaa tgaaattatg atttattaat c 271

```

<210> 193

<211> 351

<212> DNA

<213> Homo sapiens

<400> 193

```
agtcgaggcg ctgatcccta aaatggcgaa catgtgtttt catcatttca gccaaagtcc 60
taacttcctg tgcctttcct atcacctcga gaagtaatta tcagttgggt tggatttttg 120
gaccaccgtt cagtcatttt gggttgccgt gctcccaaaa cattttaaat gaaagtattg 180
gcattcaaaa agacagcaga caaaatgaaa gaaaatgaga gcagaaagta agcatttcca 240
gcctatctaa tttctttagt tttctatttg cctccagtgc agtccatttc ctaatgtata 300
ccagcctact gtactattta aaatgctcaa ttccagcacc gatggacctg c 360
```

<210> 194

<211> 311

<212> DNA

<213> Homo sapiens

<400> 194

```
ctgagacaca gaggccact gcgaggggga cagtggcggg gggactgacc tgctgacagt 60
caccctccct ctgctgggat gagggtccagg agccaactaa aacaatggca gaggagacat 120
ctctgggtgtt cccaccaccc tagatgaaaa tccacagcac agacctctac cgtgtttctc 180
ttccatccct aaaccacttc cttaaaatgt ttggatttgc aaagccaatt tggggcctgt 240
ggagcctggg gttggatagg gccatggctg gtccccacc atacctcccc tccacatcac 300
tgacacagac c 311
```

<210> 195

<211> 381

<212> DNA

<213> Homo sapiens

<400> 195

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tgtcagagtg gcactggtag aagtccagg aaccctgaac tgtaagggtt cttcatcagt 60
gccaacagga tgacatgaaa tgatgtactc agaagtgtcc tggaatgggg cccatgagat 120
ggttgtctga gagagagctt cttgtcctgt ctttttcctt ccaatcaggg gctcgctctt 180
ctgattattc ttcagggcaa tgacataaat tgtatattcg gttcccgggt ccaggccagt 240
aatagtagcc tctgtgacac cagggcgggg ccgagggacc acttctcttg gaggagaccc 300
aggcttctca tacttgatga tgtagccggg aatcctggca cgtggcgggt gccatgatac 360
cagcagggaa ttgggtgtgg t 381
```

<210> 196

<211> 401

<212> DNA

<213> Homo sapiens

<400> 196

```
cacaaacaag aggagcacca gacctcctct tggttcgag atggcttcgc cacaccaaga 60
gccccaaact ggagacctga ttgagatttt ccgccttggc tatgagcact gggccctgta 120
tataggagat ggctacgtga tccatctggc tcctccaagt gagtaccccg gggctggctc 180
ctccagtgtc ttctcagtcc tgagcaacag tgcagaggtg aaacgggagc gcctggaaga 240
tgtgggtggg ggtgttgct atcgggtcaa caacagcttg gacctgagt accaaccacg 300
gcccgtggag gtgacacca gttctgcaa ggagatggtt ggtcagaaga tgaagtacag 360
tattgtgagc aggaactgtg agcactttgt caccagacc t 401
```

<210> 197

<211> 471

<212> DNA

<213> Homo sapiens

<400> 197

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ctgtaatgat gtgagcaggg agccttcctc cctggggccac ctgcagagag ctttcccacc 60
aactttgtac cttgattgcc ttacaaagtt atttgtttac aaacagcgac catataaaaag 120
cctcctgccc caaagcttgt gggcacatgg gcacatacag actcacatac agacacacac 180
atatatgtac agacatgtac tctcacacac acaggcacca gcatacacac gtttttctag 240
gtacagctcc caggaacagc taggtgggaa agtcccatca ctgagggagc ctaaccatgt 300
ccctgaacaa aaattgggca ctcatctatt ccttttctct tgtgtcccta ctcatgaaa 360
ccaaactctg gaaaggacc aatgtaccag tatttatacc tctagtgaag cacagagaga 420
ggaagagagc tgcttaact cacacaacaa tgaactgcag acacagacct g 480
```

<210> 198

<211> 201

<212> DNA

<213> Homo sapiens

<400> 198

```
ggtccattga ggctctgtcg gccatgccc aagttcgaag ctttgccaac gaggagggcg 60
aagcccagaa gtttagggaa aagctgcaag aaataaagac actcaaccag aaggaggctg 120
tggcctatgc agtcaactcc tggaccacta gtatttcagg tatgtctgtg aaagtgggaa 180
tcctctacat tgggtggcag a 201
```

<210> 199

<211> 551

<212> DNA

<213> Homo sapiens

<400> 199

```
tctggcacag atcttcaccc acacggcggg ccacgtgctg atcatcttcc gggctctcacc 60
gggcctggaa cacaccatct tccccatgag ccggtgccc agtctggtga cttccatctt 120
ggccctggc cttatgtccc agttatgacc cctgacttca actctggctc ttaccctgta 180
actccagtc atctctgaca tttttaacac ccggccttgt gaccgtggac atagctcctg 240
acctcgattc ccattctgag ccagtgta gtccatgaga tcatgacctg actcctggctc 300
tccaaccttg tgatcctaat tctgggacct caatcctagc ctctgaactt gggaccttgg 360
agctcctgac cttagtcttg accgctaccc ttgattctga cctttgatcc tgtaacctag 420
gggtggcccc tgaccttatt actgtcattt agtccttga ccttgccact tcaatcctgg 480
ctttatgacc tcctactctc aattttaact ttaaccaa atgacaaatt gtgacactaa 540
atgaccacaa t 551
```

<210> 200

<211> 211

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(211)

<223> n=A,T,C or G

<400> 200

```
cagctcancg ggcgacatgc ccctacaagt tggcanaagn ggctgccact gctggggttg 60
tgtaagagag gctgctgnca ccattacctg cagaaacctt ctcatagggg ctacgatcgg 120
tactgctagg gggcacatag cgcccatggg tgtggttaggt ggggnactcn ntataggat 180
```

ggtaggtatc ccgggctgga aanatgnnca g 211

<210> 201

<211> 111

<212> DNA

<213> Homo sapiens

<400> 201

ccagtgaag gaaacaaaac tggcagtttg tccatttgaa tatcagacct agttttcttct 60
taatttccac actatttctc ccatattcct taaacttctt ggcattccacc t 120

<210> 202

<211> 331

<212> DNA

<213> Homo sapiens

<400> 202

tgaaaataca gaataccagg tgggtcccaaa tgtttgaagt tctttgaaca gaaagagaga 60
ggagagagag agagaggaaa attccctaac ccttgggtta aagacaatat tcattttattg 120
ctcaaatgat gcttttaagg gaggacagtg gaataaaata aacttttttt ttctccctac 180
aatacataga aggggttatca aaccactcaa gtttcaaaat ctttccaggg tccaatatca 240
ctttttttct ttcggttcaa tgaaaagcta aatgtaataa tactaattat agataaaatt 300
ttattttact ttttaaaaat ttgtccagac c 331

<210> 203

<211> 491

<212> DNA

<213> Homo sapiens

<400> 203

agtcacccag tctacttagt acctgggttg tgccctctgac cttttcagct tgataccctg 60
ggcttttagtg taaccaataa atctgtagtg accttacctg tattccctgt gctatcctgt 120
gggaaggtag gaatgggcta agtatgatga atgtatagg tagggatctt ttggttttta 180
atcacagaaa acctaatca aactggctta aaataaaaag gattttattg ttcagtgaac 240
tagaaagtcc ataggttagtg ctggctccag gtgaagactt gaccagtag ttcagtatgt 300
ctctaaatac cggactgact tttttctcac tgttgcatct tctgtaggac catttaagtc 360
tgggccactt aatggctgcc agcattccta agattacact tttcccatc tatgtccaat 420
cagaaaaaga aggcattctt gtaccagaaa tctcagcaaa agccctaata ttcacactga 480
ttaggacctg c 491

<210> 204

<211> 361

<212> DNA

<213> Homo sapiens

<400> 204

tcccttcctc ccccatgtga taaatgggtc cagggctgat caaagaactc tgactgcaga 60
actgccgctc tcagtggaca gggcatctgt tatectgaga cctgtggcag acacgtcttg 120
ttttcatttg atttttgtta agagtgcagt attgcagagt ctagggaat ttttgtttcc 180
ttgattaaca tgattttcct ggttggtaca tccagggcat ggcagtggcc tcagccttaa 240
acttttgttc ctactccac cctcagcgaa ctgggcagca cggggagggg ttggctaccc 300
ctgccatcc ctgagccagg taccaccatt gtaaggaaac actttcagaa attcagacct 360
c 361

<210> 205

<211> 471
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (2)
<223> n=A,T,C or G
<221> misc_feature
<222> (3)
<223> n=A,T,C or G

<400> 205
cnngtacagt tcttcctgga tggccgacac agatcctggg gaaaggcaat cctggcactg 60
ctctgaaacc agagctcctc ctccctcccc gggcagggtg gagctgagaa gggctgctct 120
agcgttgga ctccacctcc atacacctga tattttgata gggcagggtcc ctgctatggg 180
ccactgttct gggcagtata gtatgcttga cagcatcctt ggcatctatc caccagatcc 240
cagagcaccg gctactagct gtgacaacat cctccaaaca ttgcaaaatt tcccctggga 300
ggcaagattg cctcagatgg gagaatcacg ctctagggaa atctgctggt atgagaacc 360
caactcccca ctccactgag cctccagatg gcgagcaggc tgcagctcca gcacagacac 420
gaagctccct ccagccactg acggtccatg gctgggggta cccaggacct c 480

<210> 206
<211> 261
<212> DNA
<213> Homo sapiens

<400> 206
tagagtattt agagtcctga gataacaagg aatccaggca tcctttagac agtcttctgt 60
tgtcctttct tccaatcag agatttgtgg atgtgtggaa tgacaccacc accagcaatt 120
gtagccttga tgagagaatc caattcttca tctccacgaa tagcaagttg caagtgacga 180
ggggaataac gctttacctt taagtctttt gatgcatttc ctgccagttc aagtacctct 240
gcggtgaggt actccaggat g 261

<210> 207
<211> 361
<212> DNA
<213> Homo sapiens

<400> 207
gctctccggg agcttgaaga agaaactggc tacaaagggg acattgccga atgttctcca 60
gcggtctgta tggacccagg cttgtcaaac tgtactatac acatcgtgac agtcaccatt 120
aacggagatg atgccgaaaa cgcaaggccg aagccaaagc caggggatgg agagtgtgtg 180
gaagtcattt ctttacccaa gaatgacctg ctgcagagac ttgatgctct ggtagctgaa 240
gaacatetca cagtggacgc cagggtctat tcctacgctc tagcactgaa acatgcaaat 300
gcaaagccat ttgaagtgcc cttcttgaaa ttttaagccc aaatatgaca ctggacctgc 360
c 361

<210> 208
<211> 381
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature

<222> (1)...(381)

<223> n=A,T,C or G

<400> 208

```
agaggagatn tttgccatgc ctgaatnctt tcctatncca ccctancact taacatatta 60
cttagtctgc tttgntaaaa gcaagtatta ccttnaactt gnctcttact ctttgccctt 120
tagctaaacta ataaagnttg atntaggcat tattatataa ttctgagtca ttcattggat 180
ctctcatgtt tgatgtattt tncaaactaa gatctatgat agtttttttt ccanagttcc 240
attaaatcat ttatttcctt tactttctca cctctgtnga aacatttaga aactggattt 300
gggaacccan ttttggaata ccagattcat agtcatgaaa atggaaactt ncatattctg 360
tttttgaaaa gatgtggacc t 381
```

<210> 209

<211> 231

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (83)

<223> n=A,T,C or G

<400> 209

```
gtggagagca agtgatttat taaagcaaga cgttgaaacc tttacattct gcagtgaaga 60
tcagggtgtc attgaaagac agnggaaacc aggatgaaag tttttacatg tcacacacta 120
catttcttca atattttcac caggacttcc gcaatgaggc ttctgttctg aagggaacac 180
tgatccgtgc atctcttcac tcctaacttg gctgcaacag cttccacctg c 240
```

<210> 210

<211> 371

<212> DNA

<213> Homo sapiens

<400> 210

```
tcctccttgg ttttgacagag atcagggttgt tgacagttcc tgggtgaccc acagctaccc 60
atgtcagtta tctccactaa catatccaag aatctttgta ggacaatttc tccacctgca 120
agggttttta ggtagaactc ttcttttaag gcaattagcc cattgccaaa aggttttact 180
gtcttaaaagc tgtctttctg agatctaatt ccaaggactt ctccacagct aagtggatg 240
cctcacacca ttaggtgatg ctttggacag aacagagtat tttcatcttg tgtttaaagc 300
aattccttgg cttcggctcc tcaccacttt ctatgccagt ctcccattta tgtccctagt 360
aatgcctatg c 371
```

<210> 211

<211> 471

<212> DNA

<213> Homo sapiens

<400> 211

```
tttattttta aagaaaaaaa ttaaaataga gccaaacaaat gcaattaaga aaaaaaaagt 60
attgagacac aaggggacct acatgttctg gtctaagaag catgcaagta ttacaaagca 120
ttccagatac agtatgacag aggaacagtg aacaagcatt ggaacgatgc tctttcttcc 180
agaaacggga agtctaacag ttatgttttc acaatggtag tgattaaacc atctttattt 240
ttaagggaatt ttataggaag aatttttagca ccatcattaa aggaaaaata ataatacctt 300
tttagccctg cctatctcca gtcttggaaat aataacagaa gcatagcacc tttcagtatc 360
taaaatataa acaagaatag taagtccatc ccagcttcta gagatgaggt agctcatgct 420
```

aagaaatggtt gggtcatttt tcctatgaaa gttcaaaggc caaatgggtca c 480

<210> 212

<211> 401

<212> DNA

<213> Homo sapiens

<400> 212

```
tggcctgtct ccttcacata gtccatatca ccacaaatca cacaacaaaa gggagaggat 60
atattttggg ttcaaaaaaa gtaaaaagat aatgtagctg catttccttg gttattttgg 120
gccccaaata tttcctcatc tttttgttgt tgcatggat ggtgggtgaca tggacttggt 180
tatagaggac aggtcagctc tctggctcgg tgatctacat tctgaagttg tctgaaaatg 240
tcttcatgat taaattcagc ctaaactgtt tgccgggaac actgcagaga caatgctgtg 300
agtttccaac ctcagcccat ctgcgggcag agaaggtcta gtttgtccat caccattatg 360
atatcaggac tggttacttg gttaaggagg ggtctacctc g 401
```

<210> 213

<211> 461

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(461)

<223> n=A,T,C or G

<400> 213

```
tgtgaagcat acataaataa atgaagtaag ccatactgat ttaatttatt ggatgttatt 60
ttccctaaga cctgaaaatg aacatagtat gctagttatt ttccagtgtt agccttttac 120
tttcctcaca caatttggaa tcatataata taggtacttt gtccctgatt aaataatgtg 180
acggatagaa tgcatacagt gtttattatg aaaagagtgg aaaagtatat agcttttanc 240
aaaaggtgtt tgccattctt aagaaatgag cgaatatata gaaatagtgn gggcatttct 300
tcctgttagg tggagtgtat gtgttgacat ttctcccat ctcttccac tctgtttnt 360
ccccattatt tgaataaagt gactgctgaa nangactttg aatccttatc cacttaattt 420
aatgtttaa gaaaaaccta taatggaaag tgagactcct t 461
```

<210> 214

<211> 181

<212> DNA

<213> Homo sapiens

<400> 214

```
cctgagcttc tactcctttc ccttaagatt cctccaaagc accagctcca taaaatcctt 60
cagctcccca gaccacacc aagaaccca catgttaatt ggatcagcca aatctacaag 120
cagataagtc ctaaggagaa tgccgaagcg tttttcttct tcctcaagcc tagcatgaga 180
c 181
```

<210> 215

<211> 581

<212> DNA

<213> Homo sapiens

<400> 215

```
ctgctttaag aatggttttc caccttttcc ccctaactct taccaatcag acacatttta 60
ttattttaat ctgcacctct ctctatttta tttgccaggg gcacgatgtg acatatctgc 120
```

```

agtcccagca cagtgggaca aaaagaattt agaccccaaa agtgtcctcg gcatggatct 180
tgaacagaac cagtatctgt catggaactg aacattcatc gatggctctc atgtattcat 240
ttattcactt gttcattcaa gtatttattg aatacctgcc tcaagctaga gagaaaagag 300
agtgcgcttt ggaaatttat tccagttttc agcctacagc agattatcag ctcggtgact 360
tttctttctg ccaccattta ggtgatggtg tttgattcag agatggctga atttctattc 420
ttagcttatt gtgactgttt cagatctagt ttgggaacag attagaggcc attgtcctct 480
gtcctgatca ggtggcctgg ctgtttcttt ggatccctct gtcccagagc caccagaac 540
cctgactctt gagaatcaag aaaacacca gaaaggacct c 581

```

<210> 216

<211> 281

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(281)

<223> n=A,T,C or G

<400> 216

```

ccgatgtcct gcttctgtgg accaggggct cctctgnngg tggcctcaac cacggctgag 60
atcccctagaa gtccaggagc tgtggggaag agaagcactt agggccagcc agccgggcac 120
ccccacttgc gccccgacct acgctcacgc accagacctg ccnggcggt cgctcnaaag 180
ggcgaattct gcagatatcc atcacactgg cggacgctcg agcatgcac tagagggccc 240
aattcaccct atantgagtc gtattacaat tcaactggccg t 281

```

<210> 217

<211> 356

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(356)

<223> n=A,T,C or G

<400> 217

```

atagcagggt tcaacaattg tcttgtagtt tgnagtaaaa agacataaga aagagaaggt 60
gtggtttgca gcaatccgta gttggtttct caccataccc tgcagttctg tgagccaaag 120
gtccttgcaaa aagttaaaat aaatcacaaa gactgctgtc atatattaat tgcataaaca 180
cctcaacatt gctcagagtt tcatccgttt ggtaagaaa acattccttc aattcatcta 240
tggcatttgt agtggcattg tcgtctatga actcttgaag aagttctttg tattcagttc 300
tagacacttg tggattgatt gncttggaat tcacattctc caataagggg cctcgg 360

```

<210> 218

<211> 321

<212> DNA

<213> Homo sapiens

<400> 218

```

ttgtccatcg ggagaaaggt gtttgtcagt tgtttcataa accagattga ggaggacaaa 60
ctgctctgcc aattttctgga tttctttatt ttcagcaaac actttcttta aagcttgact 120
gtgtgggacac tcatccaagt gatgaataat catcaagggt ttgttgcttg tcttggaatt 180
atatagagct tcttcatatg tctgagtcga gatgagttgg tcaccccaac ctctggagag 240
ggtctggggc agtttggggt gagagtcctt tgtgtccttt ttggctccag gtttgactgt 300

```

ggatatctctg gacctgcctg g

321

<210> 219

<211> 271

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (41)

<223> n=A,T,C or G

<400> 219

```
ccggttaggt ccacgcgggg gcagtggagg cacaggctca nggtggccgg gctacctggc 60
accctatggc ttacaaagta gagttggccc agtttccttc cacctgaggg gagcactctg 120
actcctaaca gtcttccttg ccctgccatc atctgggggtg gctggctgtc aagaaaggcc 180
gggcatgctt tctaaacaca gccacaggag gctttagagg catcttcag gtggggaaac 240
agtcttagat aagtaagggt acttgtctaa g 271
```

<210> 220

<211> 351

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(351)

<223> n=A,T,C or G

<400> 220

```
gtcctacgac gaggaccagc tttcttctt cnacttttcc canaacactc ggggtgcctcg 60
cctgcccga tttgctgact gggctcagga acagggagat gctcctgcca ttttatttga 120
caaagagttc tgcgagtggg tgatccagca aatagggcca aaacttgatg ggaaaatccc 180
gggtgtccaga gggtttctta tcgctgaagt gttcacgctg aagccccctg agtttggcaa 240
gcccacactc ttggtctgtt ttgtcagtaa tctcttccca cccatgctga cagtgaactg 300
gtagcatcat tccgtccctg tgggaaggatt tgggcctact tttgtctcag a 360
```

<210> 221

<211> 371

<212> DNA

<213> Homo sapiens

<400> 221

```
gtctgcagaa gcgtgtctga ggtgtccggt ggagggtggca gccgagctct gggactaatc 60
accgtgctgg ggacggcacc gcgtcaggat gcaggcagat ccctgcagaa gtgtctaaaa 120
ttcacactcc tcttctggag ggacgtcgat ggtattagga tagaagcacc aggggacccc 180
acgaacggtg tcgtcgaaac agcagccctt atttgcacac tgggagggcg tgacaccagg 240
aaaaccacaa ttctgtcttt cacggggggc cactgtacac gtctctgtct gggcctcggc 300
cagggtgccg agggccagca tggacaccag gaccagggcg cagatcacct tggtctccat 360
ggtggacctc g 371
```

<210> 222

<211> 471

<212> DNA

<213> Homo sapiens

<400> 222
gtccatgttc catcattaat gttccaacat caccagggac acaaagctgc aaaaatgaga 60
agggaaataa ggtagagaa aggatccggg caatcttaag gactgaggaa gacatgttcc 120
ccaacccttg aactcacaaa ccctgaagct caaggattgc atccttcctc caaatctcac 180
tcaacataat aagtgcagaa caacatgcc aagcactgta tgaagcacta gggacaaaga 240
caagggtcaaa atccttgtaa ccaaatttaa tggattgta atgcagtgtt aacacaggac 300
agtaacagaa caccacagaa ccaaacagaa gagggtaggg ataagcataa atgaagtaac 360
atgaaataaa ctccaaatg gaaaacttgt ccataccccc agggcaagtc aactacagtc 420
tcccaaagga cataaattcc acttagggca cactagacag aaaacaatat t 480

<210> 223
<211> 411
<212> DNA
<213> Homo sapiens

<400> 223
agttgctcta caatgacaca caaatcccgt taaataaatt ataaacaagg gtcaattcaa 60
atgtgaagta atgttttagt aaggagagat tagaagacaa caggcatagc aaatgacata 120
agctaccgat taactaatcg gaacatgtaa aacagttaga aaaataaacg aactctcctc 180
ttgtcctaca atgaaagccc tcatgtgcag tagagatgca gtttcatcaa agaacaaca 240
tccttgcaaa tgggtgtgac gcggttccag atgtggattt ggcaaaacct catttaagta 300
aaaggttagc agagcaaagt gcggtgcttt agctgctgct tgtgccgctg tggcgtcggg 360
gaggctcctg cctgagcttc ctccccagc ttgtgctgct gagaggaacc a 420

<210> 224
<211> 321
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (31)
<223> n=A,T,C or G

<400> 224
gggtctgaagt ttgataacaa agaaatatat ntaagacaaa aatagacaag agttaacaat 60
aaaaacacaa ctatctgttg acataacata tggaaacttt ttgtcagaaa gctacatctt 120
cttaatctga ttgtccaaat cattaaaata tggatgattc agtgccattt tgccagaaat 180
tcggtttggct ggatcataga ttaacatttt cgagagcaaa tccaagccat tttcatccaa 240
gtttttgaca tgggatgcta ggcttcctgg ttccatttg ggaaatgtat tcttatagtc 300
ctgtaaagat tccacttctg g 321

<210> 225
<211> 251
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (34)
<223> n=A,T,C or G

<400> 225
atgtctgggg aaagagttca ttggcaaaag tgnctccca agaattggtt acaccaagca 60

```

gagaggacat gtcactgaat ggggaaaggg aacccccgta tccacagtca ctgtaagcat 120
ccagtaggca ggaagatggc ttggggcagt ggctggatga aagcagattt gagataccca 180
gctccggaac gaggtcatct tctacagggt cttccttcac tgagacaatg aattcagggt 240
gatcattctc t                                     251

```

<210> 226

<211> 331

<212> DNA

<213> Homo sapiens

<220>

<221> unsure

<222> (1)... (331)

<223> n=A,T,C or G

<400> 226

```

gttaggtccc agggcccccg ccaagnngtt accnnnnntna ccactcctga cccaaaaatc 60
aggcatggca ttaaaacgtt gcaaattcct ttactgttat cccccccacc accaggacca 120
tgtagggtgc agtctttact ccctaaccog tttcccgaaa aagggtgtac ctccctttcca 180
gacagatgag agagggcagg acttcaggct ggatccacca ctgggctctc cctccccccag 240
cctggagcac gggaggggag gtgacggctg gtgactgatg gatgggtagt gggctgagaa 300
gaggggacta ggaaggggcta ttccaggctc a                                     331

```

<210> 227

<211> 391

<212> DNA

<213> Homo sapiens

<400> 227

```

aggtctgccc ttgaagtata ggaaggaatc atagttggag gacttctgca ttatttgttg 60
gctgaagcta gaagtgaac cccctcctga tttctgcagc aagatgaact gccttatccc 120
cagcccgcag gaatgttcat atctgagcaa tcaatgggca ctgtgttcaa ccacgccatt 180
ttcaagattg gctccttaaa ccaccacaa ggcaccagct ctgggagaag ctgcaggagg 240
aagagaacaa agccctcgct gtgatcagga tgggtgtctc ataccttttc tctgggggtca 300
ttccagggtat gagacagagt tgaacctgcg catgagcgtg gaggccgaca tcaacggcct 360
gcgcagggtg ctggatgagc tgaccctgga c                                     391

```

<210> 228

<211> 391

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (35)

<223> n=A,T,C or G

<400> 228

```

gttgctccata gccacctcct gggatagaag cttnttagtt catagtctga ttagtgtgtc 60
cttaggacat aggtccagcc ctacagatta gctgggtgaa gaaggcaagt gtctcgacag 120
ggcttagtct ccacctcag gcatggaacc attcagggtg aagcctggga tgtgggcaca 180
ggagactcag gctgatataa aaataacaaa atcagtaata aaaaaattat aaaacctgtt 240
gcttgctctga atagatttga gcaacagtct tgcttttgtt aaaatcctgg agccgttaag 300
tcctgaatat tcttctggac atcattgctg gctggagaaa ggagccccag gcccggtctg 360
gctgacatct gtcaggtttg gaagtctcat c                                     391

```

<210> 229
<211> 341
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (202)
<223> n=A,T,C or G

<400> 229
gtccatggct tctcaccag acagtcttcc tgggcaactt ggggaagccc ctgttctgct 60
caagtctcac cccatggaag aggtggggga agggggcctt ggtttttcag gaagacgggt 120
tggagagcac gagtactac aaagcagtaa aagtgaatgg tgtctccagg ggctgggtcc 180
agaacaccgc ggagagcccc anccataaag gtgtgttccg cctctggcct gcaggaatct 240
ctttgaatct ctttgattgg tggctccaag agcaatggga agtcaacagc caggaggctg 300
gactgggttc cctgggaccc cgagggtccc gaggtgctg g 341

<210> 230
<211> 511
<212> DNA
<213> Homo sapiens

<400> 230
gtccaagcca aggaaaccat tcccttacag gagacctccc tgtacacaca ggaccgcctg 60
gggctaaagg aaatggacaa tgcaggacag ctagtgttcc tggctacaga aggggaccat 120
cttcagttgt ctgaagaatg gttttatgcc cacatcatac cattccttgg atgaaacccg 180
tatagttcac aatagagctc agggagcccc taactcttcc aaaccacatg ggagacagtt 240
tccttcatgc ccaagcctga gctcagatcc agcttgcaac taatccttct atcatctaac 300
atgccctact tggaaagatc taagatctga atcttatcct ttgccatctt ctgttaccat 360
atggtgttga atgcaagttt aattaccatg gagattgttt taaaaacttt tgatgtggtc 420
aagttcagtt ttagaaaagg gagtctgttc cagatcagtg ccagaactgt gcccaggccc 480
aaaggagaca actaactaaa gtagtgagat a 511

<210> 231
<211> 311
<212> DNA
<213> Homo sapiens

<400> 231
gggtccaagta agctgtgggc aggcaagccc ttcgggtcacc tgttgggtac acagaccctt 60
cccctcgtgt cagctcaggc agctcgaggc ccccgaccaa cacttgcagg ggtccctgct 120
agtttagcgc ccaccgccgt ggagttcgta ccgcttcctt agaacttcta cagaagccaa 180
gctccctgga gccctgttgg cagctctagc tttgcagtcg tgtaattggc ccaagtcatt 240
gtttttctcg cctcactttc caccagtgt ctagagtcac gtgagcctcg tgtcatctcc 300
ggggtggacc t 311

<210> 232
<211> 351
<212> DNA
<213> Homo sapiens

<400> 232
tcgttttagct aataatccct tccttgatga tacactccaa cttcttgttt ttctttatct 60

```

ctaaaaagcg gttctgtaac tctcaatcca gagatgttaa aaatgtttct aggcacggta 120
ttagtaaatc aagtaaatct catgtcctct taaaggacaa acttccagag atttgaatat 180
aaatttttat atgtgttatt gattgtcgtg taacaaatgg cccccacaaa ttagtagctt 240
aaaatagcat ttatgatgtc actgttttct ttgccttttc attaatgttc tgtacagacc 300
tatgtaaaca acttttgtat atgcatatag gatagctttt ttgaggggat a 360

```

<210> 233

<211> 511

<212> DNA

<213> Homo sapiens

<400> 233

```

aggctctggat gtaaggatgg atgctctcta tacatgctgg gttggggatg ctgggactgc 60
acagccacccc ccagtatgcc gctccaggac tctgggacta gggcgccaaa gtgtgcaaat 120
gaaaatacag gatacccagg gaactttgaa ttccagattg tgaaaagaaa acaaatcttg 180
agactccaca atcaccaagc taaaggaaaa agtcaagctg ggaactgctt agggcaaagc 240
tgcttcccat tctattcaca gtcaccccc tgaggctcac ctgcatagct gattgcttcc 300
tttccccat cgcttctgta aaaatgcaga ctactgagc cagactaaat tgtgtgttca 360
gtggaaggct gatcaagaac tcaaaagaat gcaacctttt gtctcttacc tactacaacc 420
aggaagcccc cacttaaggg ttgtcccacc ttactggact gaaccaaggt acatcttaca 480
cctactgatt gatgtctcat gtccccctaa g 511

```

<210> 234

<211> 221

<212> DNA

<213> Homo sapiens

<400> 234

```

cagggtccagc gaaggggctt cataggctac accaagcatg tccacataac cgaggaagct 60
ctctccatca gcatagcctc cgatgaccat ggtgttccac aaagggttca tcttcgagcg 120
ccggtctgtac atggcccttg tcagccatga atgaatagct ctaggactat agctgtgtcc 180
atctcccaga agctcctcat caatcaccat ctggccgaga c 221

```

<210> 235

<211> 381

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (33)

<223> n=A,T,C or G

<400> 235

```

ggtccaagaa agggacatct atgtgaaagt ganactgaga cagtgtctggt cacagggtcat 60
gctgcagaat aatacattcc caggcactgt cactgtgggg acccaagagg cccaggaggt 120
gacctataac ctctccagaa agaccactct gtgtggcatc acagtccaca cagttaaagg 180
aaatatttag acttaacaat cagacaccag ctcttactca cacttacact cacagcccac 240
acacaagtgt gcaaacatac acacacatat atatttcctg atacattcat ggaatatcag 300
agccctgccc tgaagtcgtt agtgtctctg ctccccaaac cgctgtctcc acattggcta 360
agctccctca agagacctca g 381

```

<210> 236

<211> 441

<212> DNA

<213> Homo sapiens

<400> 236

```
aggtcctggt gcccctttct tttgccaac ttcgccattt gggaattgga atatttacc 60
aacacctgta ctgcattgaa tattggaagc aaataacttg gctttgatct tataggctca 120
cagatggagg aacgtacctt gaagttcaga tgagatttcg gacttttgag ttgatgctga 180
aacagcttga gatttttggg gactactgag agatgataat tgtattgtgc aatatgagaa 240
ggacatgaga tttggtgggc ataggtgtga aatgacattg tttgatgtg tttaccctcc 300
aatctcttg ttgaatgtga tcttaaactg tgggtggtggg cctagtggaa ggtgttgaat 360
catgggggtg gactcttcat aatttgctta gctccatccc cttggtgatg agcaagtcct 420
tgctctgttg tgtcacatga g                                     441
```

<210> 237

<211> 281

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(281)

<223> n=A,T,C or G

<400> 237

```
tcctaaaaaa ttagctgacc ttgttaaaaa tgttggcgtg agcagtatat tattacctat 60
ctttttttat tgtgtgtgtg ngtgtgtgtn ttaaactaat tggctgaaat atctgcctgt 120
ttccctcttt acatttttct tgtttcttct cttattttatc tttgtccatc ttgagatcta 180
ctgtaaaagt aatnttttaa tgaaaacann nccaagtnt actctcactg ggnctgggac 240
atcagatgta attgagaggc caacaggtaa gtcttcatgt c                                     281
```

<210> 238

<211> 141

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(141)

<223> n=A,T,C or G

<400> 238

```
gtctgcctcc tcctactggt tccctctatn aaaaagcctc cttggcgag gttccctgag 60
ctgtgggatt ctgcactggt gcttnggatt cctgatatg ttccttcaaa tccactgaga 120
attaaataaa catcgctaaa g                                     141
```

<210> 239

<211> 501

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(501)

<223> n=A,T,C or G

<400> 239

```

aacaatctaa acaaatccct cggttctann atacaatgga tcccccatat tggaaggact 60
ctgangcttt attccccac tatgcntatc ttatcatattt attattatac acacatccat 120
cctaaactat actaaagccc ttttcccatg catggatgga aatggaagat ttttttctaa 180
cttggttctag aagtcttaat atgggctgtt gccatgaagg cttgcagaat tgagtccatt 240
ttctagctgc ctttattcac atagtgatgg ggtactaaaa gtactgggtt gactcagaga 300
gtcgtgtgca ttctgtcatt gctgctactc taacactgag caacactctc ccagtggcag 360
atccccgtga tcattccaag aggagcattc atccctttgc tctaataatg aggaatgatg 420
cttattagaa aacaaactgc ttgacccagg aacaagtggc ttagcttaag naaacttggc 480
tttgctcana tccctgatcc t 501

```

<210> 240

<211> 451

<212> DNA

<213> Homo sapiens

<400> 240

```

tgtcctgaaa ggccattact aatagaaaca cagcctttcc aatcctctgg aacatattct 60
gtctgggttt ttaatgtctg tggaaaaaaa ctaaacaagt ctctgtctca gtttaagagaa 120
atctattggg ctgaagggtt ctgaacctct ttctgggtct cagcagaagt aactgaagta 180
gatcaggaag gggctgcctc aggaaaattc ctatgcctta ggaattcagt gagaccctgg 240
gaaggaccag catgctaata agtgtcagtg aatccacagt ctttacttcc tgcctcataa 300
agggccaggt ctccccagta ccaagtcctt tcctcatgaa gttgtgttgc ctccaggctgt 360
ttagggacca ttgctgtctt tggtcacatg agtctgtctc cttactttag tccctgggca 420
atccttgctt aatgcttttg ttgactcaac g 451

```

<210> 241

<211> 411

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(411)

<223> n=A,T,C or G

<400> 241

```

aatctccagt gtgatggat cgggggttaga gcttcaatct ccagtgtgat ggtactgcag 60
cnagagcttc aatctccagt gngatggat taggggttaga tcttcaatct ccagtgtgat 120
ggatcagggg ttagagcttc agcctccagt gtgatggat caggggttaga gcttcagcct 180
ccagtgtgat ggtatcgggg ttagatcttc aatccccagt ggtggtgggt agagcttcaa 240
tctccagtgt gatggtattg ggggttagagc ttcaatctcc agtctgatgg tgttccggga 300
tggggctttt aagatgtaat taggggttaa gatcataagg gacctgggtc gatggggatt 360
agtncgcttn tatgaagaga cacangaggg cttgctctat ctctgactct c 420

```

<210> 242

<211> 351

<212> DNA

<213> Homo sapiens

<400> 242

```

tcccccttca caacagtaga gacctacaca gtgaactttg gggacttctg agatcagcgt 60
cctaccaaga cccagccca actcaagcta cagcagcagc acttcccaag cctgctgacc 120
acagtacat cccccatcag cacatggaag gccctggta tggacactga aaggaaagggc 180
tggtcctgcc cctttgaggg ggtgcaaaca tgactgggac ctaagagcca gaggtctgtg 240
agaggctcct gctccacctg ccagtctcgt aagaaatggg gttgctgcag tgttggagta 300

```

ggggcagagg gagggagcca aggtcactcc aataaaacaa gctcatggca c 360

<210> 243

<211> 241

<212> DNA

<213> Homo sapiens

<400> 243

```
gtctgtgctt tatcaggaaa agcacaagaa tatgtttttc tacctaaaac cctcttctac 60
tttaaaaatg gtttgctgaa tttttctatg tttttaaaat gtttttatgc ttttttttaa 120
acacgtaaag gatggaacct aatcctctcc cgagacgcct cctttgtgtt aatgcctatt 180
cttacaacag agaaacaagt acattaatat aaaaacgagt tgattattgg ggtataaaat 240
a                                                                                   241
```

<210> 244

<211> 301

<212> DNA

<213> Homo sapiens

<400> 244

```
ggtccagagc aatagcgtct gtggtgaagc gcctgcactc ctgaggagac atgcctggct 60
tatatgctgc atccacataa ccatagataa aggtgctgcc ggagccacca atggcaaaag 120
gctgtcgagt cagcattcct ccaggggttc catatacctg acctccttca cgttgggtccc 180
agccagctac catgagatgt gcagacaagt cctctcgata tttatagctg atatttctca 240
ccacatttgc agcagccaaa acaagtggag gttcctccag ttctatccca tggagctcca 300
g                                                                                   301
```

<210> 245

<211> 391

<212> DNA

<213> Homo sapiens

<400> 245

```
ctgacactgc tgatgtgggc cggggggcgc cgaggcacaa ctggtggccg gaccattgag 60
gcacctggag ggtaggcagc ttgtggtgca gacaccacag agagagaaaa gttggatgga 120
gtggtgggaa taatcagggt ggcacactgt gcctagaagc ttccagggcc accaagagaa 180
tggaagggga aactacaaca ttcacaacag aaataggagt caattcactt agaccagaa 240
ctccagaaaag ggggagtgtg ggaatctaca atttcaaagc cagctcgtgt ctacctagag 300
cccaaactg cataagcacc aggattgtac accttagtcc ctcaagatag tttcaagtga 360
gcgtgcaatt cactcttaca gaggagggcc t                                                                                   391
```

<210> 246

<211> 291

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(291)

<223> n=A,T,C or G

<400> 246

```
tcctccacag gggaagcagg aagttngacc agcttcaggc tggaacgtgc ccagggcaca 60
gagctggcaa ggtgcaaagn cntctgcaga atattcacca ggttgacaca gacctccaca 120
ttcagacata ttccaagctt ctggggtctt caggggccca gaatttcctg gtcttgggca 180
```

tggtncacaa gtcatttgtc cttcctcatt ttggaagggt ccatttggac ataaaatgca 240
agcgttctcg tgcTncatna taatagggtcc cagcctgcac tgacacattt g 300

<210> 247

<211> 471

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(471)

<223> n=A,T,C or G

<400> 247

cactgagtga atgagtatat aatttatgaa aacagaaaag tgctttggaa aaaaaaaaag 60
acaacaggag tacatacagn gaacaaaaa gagtgtacca ggaggagcan accctgaaca 120
gttanaacta tggaaatcgc tatgctttgt gttgtcacag gaggtaaaat aggaataccc 180
tgcatacaat aaatatttat tggataaata actaagcctg ataccctttt caatgcgtta 240
tacanactnt atcatcacac cactaatcta agttctcana agttaaacat tacaagactt 300
cagaacaaca taggcgtntt tggctccatt taacanaana aggaccatag tgatcattta 360
atctctatga gtcctgtctta tcttctggaa aaggggccta acaccatttc cttttgcaaa 420
aaggtagctg ccttgcttcc agttctacca tcctntagca acccatcttt n 480

<210> 248

<211> 551

<212> DNA

<213> Homo sapiens

<400> 248

ccatgggatc aggaatgggg tcaggtcagt tgacctgagc ataccattta aacatgttca 60
aatgtcccca tcccacccac tcacatgaca tggctcccga gccctgagat ctgtatccca 120
agaacctcag ttgagaaata tttatggcag cttcactgtt gctcaagagc ctgggtattg 180
tagcagcctg ggggcagggt gtccctaatt ttctccaagt tcttcacatc agccagaatc 240
ccatctatgc ttgtctccag caaatggagg tggccctctt gctgacgtgc cctctcttcc 300
agctctgaca tcatgggccg cagttggctg ttgatctggg tcttggctcg ggaaagcttc 360
tgctccagta agaccagccc ctcttcatct acactgagag gctgggtccat cagatgcagg 420
aggccgtcta atgtgttgag tgtgtcttgg attgtaacc cagcgttctt ggctctggta 480
tcaaccttct gggcttctgt aatcaccatc tgtactgcat ccatattcgt gtcgaactcc 540
agctccttcc t 551

<210> 249

<211> 181

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(181)

<223> n=A,T,C or G

<400> 249

atntccagag ggaccgtaag actggtacaa gtttacacca taagaggcga cgtgggtcagc 60
cacaatgtct tcacctccac agggggtcat caggnggtc agggcaaggg cccccagcat 120
cagagctttg tttaggatca tcctcttccc aaggcagcct tagcagttgc tgacctgccc 180
g 181

<210> 250
<211> 551
<212> DNA
<213> Homo sapiens

<400> 250
tctgtagcta ggatgagctg gctctcaagc aaaagtttgt cttcctgggt ccatttgtgg 60
ttatcacttg ttattgaatg tacatcacaa attaaagtct gcattgttgg acgtaagaga 120
atgtgccgac tttggttaacc aggagatttc atgttactgg actgcctgta gtcacgtatt 180
tctgctatga cacatccgca atgaaaaata ttaacctgag atttttctag gagatcaacc 240
aaaataggag gtaattcttc tgcattccaaa tattcaagca actctccttc ttcataagggc 300
agtcgaatgg tctcggaatc tgatccgttt tttcccctga gcatcagaga atatccctca 360
tttcctgggt atagattgac cactaaacat gacaaagtct cttgcataac aagctttctct 420
aacaagttca catttcttct taatttctta acttcaggtt ctttttcaca ttcttcaata 480
tacaagtcat aaagtttttg aaatacagat tttcttccac ttgataggta tttcctttta 540
ggagggtctct g 551

<210> 251
<211> 441
<212> DNA
<213> Homo sapiens

<400> 251
tgtctgctct cccatcctgg ttactatgag tcgctcttgg cagaaaggac cacagatgga 60
gagcttggca ctcgctccaa ctttgccgaa aagaggacaa ccaccaagt agtaggtaaa 120
aacacaattt tagcagcagt gaaataaaaa gaggaagtga ggatggggcc agggccgcaac 180
tataattaaa ctgtctgttt aggagaagct gaatccagaa gaaacacaag ctgtaaagt 240
agagaggaca gggagcaggg cctttggaga gcaggagagg acaggctgtc accaagcgt 300
gctcggactc tgcctgaaa gatttgaatt ggacactgtc cagtcacgtg tgtggcaaac 360
cgtactccaa gcacttttct cacggcagag gaaggagctg ccatggctgt acccctgaac 420
gtttgtgggg ccagcgatgt g 441

<210> 252
<211> 406
<212> DNA
<213> Homo sapiens

<400> 252
tttttttttg aacaagtaaa aatttcttta tttgctgaca ataagataac ctacagggaa 60
aacctgatga aatctattaa aaagttacta aaactaataa aagaatttag gaaggttata 120
gaatgtaaga ccaagacaca aaaatcaatt acatttctat ataatagcaa tgaacagata 180
ctgaaatttt aaaaactaaa tcattttaca aaagtatcac aatatgaaac actccgggat 240
aaattggata aaagatgtgc aagactgtac aaaagctaca aaacatttat gaaggaaatt 300
ggaagataga aacaagatag aaaatgaaaa tattgtcaag agtttcagat agaaaatgaa 360
aaacaagcta agacaagtat tggagaagta tagaagatag aaaaat 406

<210> 253
<211> 544
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (224)

<223> n=A,T,C or G

<400> 253

```
gaaggagttc agtagcaaag tcacacctgt ccaattccct gagctttgct cactcagcta 60
atgggatggc aaagggtggtg gtgctttcat cttcaggcag aagcctctgc ccatccccct 120
caagggtctgc aggccagtt ctcagtctgc ccttggtggtg gcatctgtta acagaggaga 180
acgtctgggt ggcggcagca gctttgctct gactgcctac aaanctaag cttggtgcta 240
gaaacatcat cattattaaa cttcagaaaa gcagcagcca tgttcagtca ggctcatgct 300
gcctcactgc ttaagtgcct gcaggagccg cctgccaaag tccccctcct acacctggca 360
cactgggggtc tgcacaaggc tttgtcaacc aaagacagct tccccctttt gattgcctgt 420
agactttgga gccaaagaaac actctgtgtg actctacaca cacttcaggt ggtttgtgct 480
tcaaagtcat tgatgcaact tgaaaggaaa cagtttaatg gtggaaatga actaccattt 540
ataa 544
```

<210> 254

<211> 339

<212> DNA

<213> Homo sapiens

<400> 254

```
tggcattcag ggcagtgtct tctgcatctc ctaggaacct cgggagcggc agctccggcg 60
cctggtagcg agaggcgggt tccggagatc ccggcctcac ttcgtcccac tgtgggttagg 120
ggtgagtcct gcaaatgtta agtgatttgc tcaagggtgc catttcgcag gaattggagc 180
ccaggccagt tctctgagcc tatcattagg gctaaaggag tgcgtgatca gaatgggtgc 240
tggacggttc tacttgcct gcctgctgct ggggtccctg ggctctatgt gcacctctt 300
cactatctac tggatgcagt actggcgtgg ttgctttgc 339
```

<210> 255

<211> 405

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(405)

<223> n=A,T,C or G

<400> 255

```
gaggtttttt nttttttttt tttttttttt caattaaana tttgatttat tcaagtatgt 60
gaaaacattn tacaatggaa actttnttta aatgctgcat gtncgtgtct atggaccacn 120
cacatacagc catgctgttt caaaaaactt gaaatgccat tgatagttaa aaaactntac 180
ncccgatgga aaatcgagga aaacaattta atgtttcatn tgaatccana ggngcatcaa 240
attaaatgac agctccactt ggcaaataat agctgttact tgatggatc caaaaaaaaa 300
tggttgggga tggataaatt caaaaatgct tccccaagg ngggngggtt ttaaaaagt 360
tcaggncaca acccttgcan aaaacactga tgcccaacac antga 405
```

<210> 256

<211> 209

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (6)

<223> n=A,T,C or G

<400> 256

```
gggcangtct ggctctctcc ccacatgtca cactctctctc agcctctccc ccaaccctgc 60
tctccctcct cccctgccct agcccaggga cagagtctag gaggagcctg gggcagagct 120
ggaggcagga agagagcact ggacagacag ctatggtttg gattggggaa gaggttagga 180
agtaggttct taaagaccct tttttagta 209
```

<210> 257

<211> 343

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(343)

<223> n=A,T,C or G

<400> 257

```
tctggacacc ataatccctt ttaagtggct ggatgggtcac acctctccca ttgacaagct 60
gggttaagtc aataggttga ctaggatcaa cagacccaa atcaataaga tactgcagtc 120
tattgagact caaaggctta tactggcgctc tgaaactatg tccttcgtta aaccgtatt 180
ttgggattcg gatgtaaaat ggagtctggc ctccctcaaa gcccaagcgg ggccgggttc 240
ctctttgcct ttctccttta tggcctctgc cacattttct acctcttctc cgacctcttg 300
gtcttntctc nggtttcttg gagccgggat tcggctttaa gtn 343
```

<210> 258

<211> 519

<212> DNA

<213> Homo sapiens

<400> 258

```
gcggtctctg acttctagaa gactaaggct ggtctgtgtt tgcttgcttg cccacctttg 60
gctgataccc agagaacctg ggcacttgct gcctgatgcc caccctgcc agtcattcct 120
ccattcacc cgcgggaggt gggatgtgag acagcccaca ttggaaaatc cagaaaaccg 180
ggaacaggga tttgcccttc acaattctac tccccagatc ctctcccctg gacacaggag 240
accacagggg caggacccta agatctgggg aaaggaggctc ctgagaacct tgaggtaccc 300
ttagatcctt ttctaccac tttcctatgg aggatccaa gtcaccactt ctctaccgg 360
cttctaccag ggtccaggac taaggcgttt tctccatagc ctcaacattt tgggaatctt 420
cccttaatca cccttgctcc tcctgggtgc ctggaagatg gactggcaga gacctctttg 480
ttgcgttttg tgctttgatg ccaggaatgc cgcctagtt 519
```

<210> 259

<211> 371

<212> DNA

<213> Homo sapiens

<400> 259

```
attgtcaact atatacacag tagtgaggaa taaaatgcac acaaaacaat ggatagaata 60
tgaaaatgtc ttctaaatat gaccagtcta gcatagaacc ttcttctctt ccttctcagg 120
tcttccagct ccattgtatc taaccactt aacaaacgtg gacgtatcgc ttccagaggc 180
cgtcttaaca actccatttc caaaagtcac ctccagaaga catgtatttt ctatgatttc 240
ttttaaaca atgagaattt acaagatgtg taactttcta actctatttt atcatacgtc 300
ggcaacctct ttccatctag aagggttaga tgtgacaaat gttttctatt aaaagggttg 360
ggtggagttg a 371
```

<210> 260
<211> 430
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(430)
<223> n=A,T,C or G

<400> 260
ttggattttt tgacttgcca tttcagtttt tttacttttt tttttttttt ttttganaaa 60
tactatatatt attgtcaaag agtggtagat aggtgagtag tcatcttccc tctcatgccg 120
gtatactctg cttcgctgtt tcagtataag ttttccgtag ttctgaacgt cccttgacca 180
caccataana caagcgcaag tcactcanaa ttgccactgg aaaactggct caactatcat 240
ttgaggaaaag actganaaaag cctatcccaa agtaatggac atgcaccaac atcgcggtac 300
ctacatgttc ccgtttttct gccaatctac ctgtgtttcc aagataaatt accaccagg 360
gagtcacttc ctgctatgtg aacaaaaacc cggtttcttt ctggagggtg ttgactactc 420
tctcngagc 430

<210> 261
<211> 365
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (178)
<223> n=A,T,C or G

<400> 261
tcctgacgat agccatgggt gtaccactta actatgattc tattccaact gttcagaatc 60
atatcacaaa atgacttgta cacagtagtt tacaacgact cccaagagag gaaaaaaaaa 120
aaaaaaagacg cctcaaaaatt cactcaactt ttgagacagc aatggcaata ggcagcanag 180
aagctatgct gcaactgagg gcacatatca ttgaagatgt cacaggagtt taagagacag 240
gctggaaaaa atctcactat aagcaaacag tagtatctca taccaagcaa aaccaagtag 300
tatctgctca gcctgccgct aacagatctc acaatcacca actgtgcttt aggactgtca 360
ccaaa 365

<210> 262
<211> 500
<212> DNA
<213> Homo sapiens

<400> 262
cctagatgtc atttgggacc cttcacaacc attttgaagc cctgtttgag tccttgggat 60
atgtgagctg tttctatgca taatggatat tcgggggttaa caacagtccc ctgcttggct 120
tctattctga atccttttct ttcaccatgg ggtgcctgaa ggggtggctga tgcataatgt 180
acaatggcac ccagtgtaaa gcagctacaa ttaggagtgg atgtgttctg tagcatccta 240
tttaaataag cctattttat cctttggccc gtcaactctg ttatctgctg cttgtactgg 300
tgctgtact tttctgactc tcattgacca tattccacga ccatgggtgt catccattac 360
ttgatcctac tttacatgtc tagtctgtgt ggttgggtgt gaataggctt ctttttacat 420
ggtgctgccg gccagctaa ttaatggtgc acgtggactt ttagcaagcg ggctcactgg 480
aagagactga acctggcatg 500

<210> 263
<211> 413
<212> DNA
<213> Homo sapiens

<400> 263
ctcagagagg ttgaaagatt tgcctacgaa agggacagtg atgaagctaa gctctagatc 60
caggatgtct gacttcaaatt tgaaactccc aaagtaata gaattggaagg gtggggtgtg 120
gcctttccag gatgggggtc ttttctgctc ccagcggata gtgaaacccc tgtctgcacc 180
tggttgggag tggtgctttc ccaaagggtt tttttttagg tccgtcgctg tcttgtggat 240
taggcattat tatctttact ttgtctccaa ataacctgga gaatggagag agtagtgacc 300
agctcagggc cacagtgcga tgaggacat cttctcacct ctctaaatgc aggaagaaac 360
gcagagtaac gtggaagtgg tccacaccta ccgccagcac attgtgaatg aca 420

<210> 264
<211> 524
<212> DNA
<213> Homo sapiens

<400> 264
tccaatgggg ccctgagagc tgtgacagga actcacactc tggcactggc agcaaaacac 60
cattccaccc cactcatcgt ctgtgcacct atgttcaaac tttctccaca gtcccccaat 120
gaagaagact catttcataa gtttgtggct cctgaagaag tcctgccatt cacagaaggg 180
gacattcttg agaaggtcag cgtgcattgc cctgtgtttg actacgttcc cccagagctc 240
attaccctct ttatctccaa cattggtggg aatgcacctt cctacatcta ccgctgatg 300
agtgaactct accatcctga tgatcatgtt ttatgaccga ccacacgtgt cctaagcaga 360
ttgcttaggc agatacagaa tgaagaggag acttgagtgt tgctgctgaa gcacatcctt 420
gcaatgtggg agtgcacagg agtccaccta aaaaaaaaaa tccttgatac tggtgcctgc 480
cttttttagtc accccgtaac aagggcacac atccaggact gtgt 524

<210> 265
<211> 344
<212> DNA
<213> Homo sapiens

<400> 265
tcctttcttc tacttcagga gatgattcaa agttacttgt ggacatttct ttaagttctg 60
aagacaaatg agacaggatt tggcctgcgg gttcttcaga cttctctacc acctccatta 120
actcttcacg ttggcttgac gtaggcaatg cactattttg ctcttttgtt tctggagatg 180
accagcacc acttctttct cttggcgggg ttctaagtgt gtctttgaat accagtgaag 240
actcaggcct atcctgtact ggaaaggac taaatttgc tttctgtcta ggaggtgatg 300
cagtagcatc ctctgaggg ggtaaggcca ttttctcttt ttga 344

<210> 266
<211> 210
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (78)
<223> n=A,T,C or G

<400> 266
ccacaatgtc cataacttga gcaggctttg gcatcccacc acccccttca gaccaataca 60

```

cactatgttg gaggaacnac tttaaaatgt aaaatgagaa atgggcactg aacactccat 120
cctcactccc aacagcccac ccacacacct cttcaactgc tatccaaaca tggaggagct 180
cttgtggaag agaggctcaa caccaaataa                                210

```

<210> 267

<211> 238

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(238)

<400> 267

```

tcggncctcc caccctctna ctgaaattct ntgaaattct cccctttggg atgaggatgg 60
caaccccagg catgtaccct cccaacctgg gacccgacct aataccctaa catcctgctg 120
acagtggctg ttctcgctgg gcaggcgctc caaagcacat cgagccagat tcaggcagag 180
tggaactggc cctcagcca tcagtggagg tggcctggga ggctctacc tgaacggg 240

```

<210> 268

<211> 461

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (459)

<223> n=A,T,C or G

<400> 268

```

tcctcaagga catgcccctt gatagaaact cagttcctgt ctccagttcc ctccctggacc 60
tgatcccca aatgcagggc ctgggactat atccagttcc ttattttcag aggcccatgc 120
acaagatgca cagcaaataa gtgctgaata aagaccagc tactgctagc ttaccctgct 180
ccaaacattc accaagtcct cagcaaagag ggccatccat tcacctcttc taaaaacaca 240
ctgagctccc cagtcctatac cccaagatat gcttggctcc caactatccc tcctctctca 300
tctccaagcc agtttccctt ttctaagtat actgatatta ccaaagacac tgacaatctt 360
cttttcttac ctctccccag tgactagggt tgcagcagga gctctataag tcctagtata 420
cagcagaagc tccataaatg tgtgctgacc taacattang c                                461

```

<210> 269

<211> 434

<212> DNA

<213> Homo sapiens

<400> 269

```

ctgtgttggg gagcaccgat tcccactcaa tatggcgtgg cttacagtct tcattaggtt 60
cccgtcccca accagaatga ggaatgatca cttcatctgt caaggcatgc agtgcattgg 120
ccacaatctc cattttgatt gagtcatggg atgaaagatt ccacagggtt ccggtataaa 180
cttcagttaag gtccatatca cgagccttc gaagcaatcg cacaagggca ggcacaccat 240
cacagttttt tatggcaatc ttgttatcct ggtcacgtcc aaaagagata ttcttgagag 300
ctccacaggc tccaagggtg acttcctttt tgggatgggc taacaatccc accagtactg 360
ggatgcctct gagcttccgc acgtcagttc tcacctgtgc attgcggtag cataagtgtt 420
gcaggatgc aaga                                434

```

<210> 270

<211> 156
<212> DNA
<213> Homo sapiens

<400> 270
ctgcaccagc gattaccagt ggcattcaaa tactgtgtga ctaaggattt tgtatgctcc 60
ccagtagaac cagaatcaga caggtatgag ctagtcaaca gcaagtcttt gttggattcg 120
agtaggctca ggatctgctg aaggtcggag gaggta 156

<210> 271
<211> 533
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)... (533)
<223> n=A,T,C or G

<400> 271
ccactgtcac ggtctgtctg acacttactg ccaaacgcat ggcaaggaaa aactgcttag 60
tgaagaactt agaagctgtg gagaccttgg ggtccacgtn caccatctgc tctgataaaa 120
ctggaactct gactcanaac cggatgacag tggccacat gtggtttgac aatcaaatcc 180
atgaagctga tacgacagag aatcagagt gtgtctcttt tgacaagact tcagctacct 240
ggcttgctct gtcagaatt gcaggtcttt gtaacagggc agtgtttcag gctaaccagg 300
aaaacctacc tattcttaag cgggcagttg caggagatgc ctctgagtca gcaactctaa 360
agtgcataga gctgtgctgt ggntnctgta aggagatgag agaaagatac nccaaaatcg 420
tcgagatacc cttcaactcc accaacaagt accagttgtc tattcataag aacccaaca 480
catcgagacc ccaacacctg ttggtgatga agggcgcccc agaaaggatc cta 540

<210> 272
<211> 630
<212> DNA
<213> Homo sapiens

<400> 272
tggatatttt ctttttcttt tggatgtttt atactttttt ttcttttttc ttctctattc 60
ttttcttcgc cttcccgtag ttctgtcttc cagtttttcca cttcaaactt ctatcttctc 120
caaattgttt catcctacca ctcccaatta atctttccat ttctgtctgc gtttagtaaa 180
tgcgttaact aggctttaaa tgacgcaatt ctccctgcgt catggatttc aagggtcttt 240
aatcaccttc ggtttaatct ctttttaaaa gatcgccctc aaattatttt aatcacctac 300
aacttttaaa ctaaacttta agctgtttta gtcaccttca ttttaattct aaagcattgc 360
ccttctattg gtattaattc ggggctctgt agtcctttct ctcaattttc ttttaaatac 420
attttttact ccatgaagaa gcttcatctc aacctccgtc atgttttaga aaccttttat 480
cttttcttct ctcattgtac tcttctaagt cttcatattt tctcttaaaa tcttaagcta 540
ttaaaattac gttaaaaact taacgctaag caatatctta gtaacctatt gactatattt 600
tttaagtagt tgtattaatc tctatctttc 630

<210> 273
<211> 400
<212> DNA
<213> Homo sapiens

<400> 273
tctggtttgc cctccagttc attctgaatc tagacttgct cagcctaatac aagttctctg 60

```

acaaccagaa gcgacacagg ttccttttgggt atcatccaca agtgaggggt acacagcatc 120
tcaacccttg taccagcctt ctcatgtctac agagcaacga ccacagaagg aaccaattga 180
tcagattcag gcaacaatct ctttaaatac agaccagact acagcatcat catcccttcc 240
tgctgctgtc cagcctcaag tatttcaggc tgggacaagc aaacctttac atagcagtgg 300
aatcaatgta aatgcagctc cattccaatc catgcaaagc gtgttcaata tgaatgcccc 360
agttcctcct gttaatgaac cagaaacttt aaaacagcaa 400

```

```

<210> 274
<211> 351
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (2)
<223> n=A,T,C or G

```

```

<400> 274
tntgagtatg tcccagagaa ggtgaagaaa gcggaaaaga aattagaaga gaatccatat 60
gaccttgatg cttggagcat tctcattcga gaggcacaga atcaacctat agacaaaagca 120
cggaagactt atgaacgcct tgttgcccag tccccagtt ctggcagatt ctggaaactg 180
tacattgaag cagagggtac tattttattt tattttttct tatatcagta ttgcagcatt 240
cactgtagtg atagaaaaca agttaggaac atagccaatt aggacaagga ggatttaaat 300
gtgtcttacc tttattttgt aaaataggta taaaggagta attaaaaatga a 360

```

```

<210> 275
<211> 381
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(381)
<223> n=A,T,C or G

```

```

<400> 275
gcngnggtcgc nnncgaggtc tgagaagccc ataccactat ttgttgagaa atgtgtggaa 60
tttattgaag atacaggggt atgtaccgaa ggactctacc gtgtcagcgg gaataaaact 120
gaccaagaca atattcaaaa gcagtttgat caagatcata atatcaatct agtgtcaatg 180
gaagtaacag taaatgctgt agctggagcc cttaaagctt tctttgcaga tctgccagat 240
cctttaattc catattctct tcattccagaa ctattggaag cagcaaaaat cccggataaa 300
acagaacgct ttcatgcctt gaaagaaatt gttaaagaaat ttcattcctgt aaactatgat 360
gtattcagat acgtgataac a 381

```

```

<210> 276
<211> 390
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (5)
<223> n=A,T,C or G

```

```

<400> 276

```



```

gctcngactc cggcgggacc tgctcggagg aatggcgccg ccgggttcaa gcactgtctt 60
cctgttggtc ctgacaatca tagccagcac ctgggtctctg acgcccactc actacctcac 120
caagcatgac gtggagagac taaaagcctc gctggatcgc cttttcacia atttggaatc 180
tgctttctac tccatcgtgg gactcagcag ccttggtgct caggtgccag atgcaaagaa 240
agcatgtacc tacatcagat ctaaccttga tcccagcaat gtggattccc tcttctacgc 300
tgcccaggcc agccaggccc tctcaggatg tgagatctct atttcaaag agaccaaaga 360
tctgcttctg gcagacctcg gccgcgacca 390

```

<210> 277

<211> 378

<212> DNA

<213> Homo sapiens

<400> 277

```

tggaacttc tggggttagga cgttgtctgc tatctccagt tccacagacc caaccagtta 60
cgatgggtttt ggaccattta tgccgggatt cgacatcatt ccctataatg atctgcccgc 120
actgggagcgt gctcttcagg atccaaatgt ggctgcgttc atggtagaac caattcaggg 180
tgaagcaggc gttgttgttc cggatccagg ttacctaatg ggagtgcgag agctctgcac 240
caggcaccag gttctcttta ttgctgatga aatacagaca ggattggcca gaactggttag 300
atggctggct gttgattatg aaaatgtcag acctgatata gtcctccttg gaaaggccct 360
ttctgggggc ttatacc 378

```

<210> 278

<211> 366

<212> DNA

<213> Homo sapiens

<400> 278

```

ggagggcaca ttccttttca cctcagagtc ggtcggggaa ggccaccag ataagatttg 60
tgaccaaacc agtgatgctg tccttgatgc ccaccttcag caggatcctg atgccaaagt 120
agcttggtgaa actgttgcta aaactggaat gatccttctt gctggggaaa ttacatccag 180
agctgctgtt gactaccaga aagtgggttcg tgaagctgtt aaacacattg gatatgatga 240
ttcttccaaa ggttttgact acaagacttg taacgtgctg gtagccttg agcaacagtc 300
accagatatt gctcaagggtg ttcactctga cagaaatgaa gaagacattg gtgctggaga 360
ccaggg 366

```

<210> 279

<211> 435

<212> DNA

<213> Homo sapiens

<400> 279

```

cctaagaact gagacttggtg acacaaggcc aacgacctaa gattagccca ggggtgtagc 60
tggaagacct acaaccaag gatggaaggc ccctgtcaca aagcctacct agatggatag 120
aggacccaag cgaaaaagat atctcaagac taacggccgg aatctggagg cccatgacct 180
agaacccagg aaggatagaa gcttgaagac ctggggaaat cccaagatga gaaccctaaa 240
ccctacctct tttctattgt ttacacttct tactcttaga tatttccagt tctcctgttt 300
atctttaagc ctgattcttt tgagatgtac tttttgatgt tgccggttac ctttagattg 360
acaagtatta tgccctggcca gtcttgagcc agctttaaat cacagctttt acctatttgt 420
taggctatag tgttt 435

```

<210> 280

<211> 435

<212> DNA

<213> Homo sapiens

<400> 280

```
tctggatgag ctgctaactg agcacaggat gacctgggac ccagcccagc cccccgaga 60
cctgactgag gccttcctgg caaagaagga gaaggccaag gggagccctg agagcagctt 120
caatgatgag aacctgcgca tagtggtggg taacctgttc cttgccggga tggtagaccac 180
ctcgaccacg ctggcctggg gcctcctgct catgatccta cacctggatg tgcagcgtga 240
gcccagacct gtccggggcg ccgctcgaaa ttccagcaca ctggcgggcg ttactagtgg 300
atccgagctc ggtaccaagc ttggcgtaat catggtcata gctgtttcct gtgtgaaatt 360
gttatccgct cacaattcca cacaacatac gagccggaag cataaagtgt aaagcctggg 420
gtgcctaata agtga 435
```

<210> 281

<211> 440

<212> DNA

<213> Homo sapiens

<400> 281

```
catctgatct ataaatgcgg tggcatcgac aaaagaacca ttgaaaaatt tgagaaggag 60
gctgctgaga tgggaaaggg ctcccttcaag tatgcctggg tcttggataa actgaaagct 120
gagcgtgaac gtggtatcac cattgatatc tccttgtgga aatttgagac cagcaagtac 180
tatgtgacta tcattgatgc cccaggacac agagacttta tcaaaaacat gattacaggg 240
acatctcagg ctgactgtgc tgtcctgatt gttgctgctg gtgttgggtga atttgaagct 300
ggtatctcca agaatgggca gacccgagag catgcccttc tggcttacac actgggtgtg 360
aaacaactaa ttgtcgggtg taacaaaatg gattccactg agccccctac agccagaaga 420
gatatgagga aattgttaag 440
```

<210> 282

<211> 502

<212> DNA

<213> Homo sapiens

<400> 282

```
tctgtggcgc aggagcccc tccccggcga gctctgacgt ctccaccgca gggactggtg 60
cttctcggag ctcccactcc tcagactccg gtggaagtga cgtggacctg gatcccactg 120
atggcaagct cttccccagc gatggttttc gtgactgcaa gaagggggat cccaagcacg 180
ggaagcggaa acgaggccgg ccccgaaagc tgagcaaaga gtactgggac tgtctcgagg 240
gcaagaagag caagcacgcg cccagaggca cccacctgtg ggagttcatc cgggacatcc 300
tcatccaccc ggagctcaac gagggcctca tgaagtggga gaatcggcat gaaggcgtct 360
tcaagttcct gcgtcccag gctgtggccc aactatgggg ccaaaagaaa aagaacagca 420
acatgacctc cgagaagctg agccgggcca tgaggtaact ctacaaacgg gagatcctgg 480
aacgggtgga tggccggcga ct 502
```

<210> 283

<211> 433

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(433)

<223> n=A,T,C or G

<400> 283

```
ccatattaga ttactggaac atctaagcat cagtgtgtga ccatgcgaac aaaagacttc 60
ggggagtgtc tatttttaaa aaggtttatg tgtgtcgagg cagttgtaaa agatttactg 120
```

```
cagaatcaan cccactttta ggcttangac caggttctaa ctatctaaaa atattgactg 180
ataacaaaaa gtgttctaaa tgtggctatt ctgatccata nttgnttttt aaagaaaaaa 240
antgnttata cagaaagagt ntaaaagttc tgtgaattna atgcaaatta gncnccantc 300
ttgacttccc aaanacttga ttnatacctt tnactcctnt cnnttcctgn ncttcnttaa 360
nntcaatnat tnggnagtnn anggccntcn gnanaacacc nttncncgnt ccncgcaatc 420
cancegcctt nan 433
```

<210> 284

<211> 479

<212> DNA

<213> Homo sapiens

<400> 284

```
tctggaagga tcagggatct gagcaaagcc aagtttactt aagctaagcc acttgttcct 60
gggtcaagca gtttgttttc taataagcat cattcctgat cattagagca aagggatgaa 120
tgctcctctt ggaatgatac aggggatctg ccactgggag agtggtgctc agtggttagag 180
tagcagcaat gacagaatga cagcgactct ctgagtcaac ccagtacttt tagtaccctg 240
tcactatgtg aataaaggca gctagaaaat ggactcaatt ctgcaagcct tcatggcaac 300
agcccatatt aagacttcta gaacaagtta aaaaaaaatc ttccatttcc atccatgcat 360
gggaaaaggg ctttagtata gtttaggatg gatgtgtgta taataataaa atgataagat 420
atgcatagtg ggggaataaa gcctcagagt ccttccagta tggggaatcc attgtatct 480
```

<210> 285

<211> 435

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(435)

<223> n=A,T,C or G

<400> 285

```
tttttttttt tttttttttt tcaatanaaa tgccataatt tattccattg tataaaaaag 60
tcatccttat gtaacaaaat gtnttcttan aanaanaaat atattatttc aggtcataaa 120
taatcagcaa acatacaact gttggcaact aaaaaaaaac ccaacactgg tattttccat 180
cagngctgaa aacaaacctg cttaaanata tatttacagg gatagtncag tntctaaaaa 240
caaaaattga ggtatttttg ttcttctagg agtagacaat gacatttttg gangggcaga 300
cccctnnccc aaaaaataaa ataagggnat nttcttcant atngaanann gggggcgccc 360
cggggaaaaa naaaccttgg gnnggggggt tggcccaagc ccttgaaaaa aaantttntt 420
tcccaaaaaa aacng 435
```

<210> 286

<211> 301

<212> DNA

<213> Homo sapiens

<400> 286

```
cctggtttct ggtggcctct atgaatccca tgtaggggtg agaccgtact ccatccctcc 60
ctgtgagcac cacgtcaacg gctcccggcc cccatgcacg ggggaggag ataccccaa 120
gtgtagcaag atctgtgagc ctggctacag cccgacctac aaacaggaca agcactacgg 180
atacaattcc tacagcgtct ccaatagcga gaaggacatc atggccgaga tctacaaaaa 240
cggccccgtg gagggagctt tctctgtgta ttcggacttc ctgctctaca agtcaggagt 300
g 301
```

<210> 287
<211> 432
<212> DNA
<213> Homo sapiens

<400> 287
tccagcttgt tgccagcatg agaaccgcca ttgatgacat tgaacgccgg gactggcagg 60
atgacttcag agttgccagc caagtcagcg atgtggcggt acagggggac ccccttctca 120
acggcaccag ctttgcagac ggcaaggagc acccccagaa tggcgttcgc accaaactta 180
gatttatttt ctgttccatc catctcgatc atcagtttgt caatcttctc ttgttctgtg 240
acgttcagtt tcttgctaac cagggcaggg gcaatagttt tattgatgtg ctcaacagcc 300
tttgagacac ccttcccat atagcgagtc ttatcattgt cccggagctc tagggcctca 360
tagataccag ttgaagcacc actgggcaca gcagctctga agagaccttt tgaggtgaag 420
agatcaacct ca 432

<210> 288
<211> 326
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (254)
<223> n=A,T,C or G

<400> 288
tctggctcaa gtcaaagtc tggtcctctt ctccgcctcc ttcttcatca tagtaataaa 60
cgttgtcccg ggtgtcatcc tctgggggca gtaagggtc tttgaccacc gctctcctcc 120
gaagaacacg caagagcagc agaatcagaa ttgcaaaagc aagaattcct ccaagaatcc 180
ccagaatggc aggaatttgc aatcctgctt cgacaggctg tgccttctca cagacgcccg 240
cggcccttcc acantcacac acgctgacct ctaagggtgt cacttgggtt ttattctggt 300
tatccatgag cttgagattg attttg 326

<210> 289
<211> 451
<212> DNA
<213> Homo sapiens

<400> 289
gtccccggtgt ggctgtgccg ttggctcctgt gcggctcactt agccaagatg cctgaggaaa 60
cccagaccca agaccaaccg atggaggagg aggagggtga gacgttcgcc tttcaggcag 120
aaattgcccc gttgatgtca ttgatcatca atactttcta ctgaaacaaa gagatctttc 180
tgagagagct catttcaa atcatcagatg cattggacaa aatccggtat gaaagcttga 240
cagatcccgag taaattagac tctgggaaag agctgcatat taaccttata ccgaacaaac 300
aagatcgaac tctcactatt gtggatactg gaattggaat gaccaaggct gacttgatca 360
ataaccttgg tactatcgcc aagtctggga ccaaagcggt catggaagct ttgcaggctg 420
gtgcagatat ctctatgatt ggacctcggc c 451

<210> 290
<211> 494
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature

<222> (421)

<223> n=A,T,C or G

<400> 290

```
tttttttttt tcaaaacagt atattttatt ttacaatagc aaccaactcc ccagtttgtt 60
tcaattgtga catctagatg gcttaagatt actttctggt ggtcacccat gctgaacaat 120
atttttcaat cttccaaaca gcaaagactc aaaagagatt ctgcatttca catcagttca 180
caagttcaag agtcttccat ttatcttagc ttttgggaata aattatcttt gaggtagaag 240
gacaatgacg aagccactta attccttggt tctgcataaa agcagattta ttcatacaca 300
cttcatttat gtgaataaag cagatgatga taaaatgttc tcttattctt gtttaatcag 360
tagtggtagt gatgccagaa acttgtaaat gcacttcaaa ccaattgtgg ctcaagtgtg 420
ngtggttccc caaggctggt accaatgaga ctggggtttg ggaattagtt ggtcatcatc 480
cctcctgctg ccca 494
```

<210> 291

<211> 535

<212> DNA

<213> Homo sapiens

<400> 291

```
tcgcgtgctt aacatgaaaa caaactttgt gctgtttggt tcattgtatg cattgatgga 60
gtcttgtctc tcatcatggg gtgtctgacc atccaacctg cagtactcat aatttctcca 120
catgcaataa tcttccaaaa tgtccaatac ccttgtcatt tgactgaaga ttagtactcg 180
tgaaccttgt tcttttaact tagggagcag ctgttctaaa accaccattt tgccactggt 240
ggttactaga tgcatactcg ttgtataagg tggaccagggt tctgctccat caaagagata 300
tggatgatta caacattttc tcaactgcat taggatgttc aataacctca ttttgtccat 360
cttgccctgct gagttgagta tatctatata cttcattaat atccgagtat accattccct 420
ttgcattttg ctgaggccca catagatttt tacttccttc tttggaggca aactcttttc 480
aacatcagcc ttaattcgac gaaggaggaa tggacgcaaa accatatgaa gcctc 540
```

<210> 292

<211> 376

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(376)

<223> n=A,T,C or G

<400> 292

```
tacnagcccc tgctgatcga gatcctggtg gaggtgatgg atccttcctt cgtgtgcttg 60
aaaattggag cctgcccctc ggcccataag ccttggttgg gaactgagaa gtgtatatgg 120
ggcccaagct actggtgcca gaacacagag acagcagccc agtgcaatgc tgtcgagcat 180
tgcaaacgcc atgtgtggaa ctaggaggag gaatattcca tcttggcaga aaccacagca 240
ttgggttttt tctacttggt tgtctggggg aatgaacgca cagatctggt tgactttggt 300
ataaaaatag ggctccccca cctcccccat ttttgtgtcc tttattgnag cattgctgtc 360
tgcaagggag ccccta 376
```

<210> 293

<211> 320

<212> DNA

<213> Homo sapiens

<400> 293

```

tcggctgctt cctggctctgg cggggatggg tttgctttgg aaatcctcta ggaggctcct 60
cctcgcacatg cctgcagtct ggcagcagcc ccgagttgtt tcctcgcctga tcgatttctt 120
tcctccaggt agagttttct ttgcttatgt tgaattccat tgcctctttt ctcatcacag 180
aagtgatgtt ggaatcgttt cttttgtttg tctgatttat ggttttttta agtataaaca 240
aaagtttttt attagcattc tgaaaagaagg aaagtaaaat gtacaagttt aataaaaagg 300
ggccttcccc tttagaatag                                     320

```

<210> 294

<211> 359

<212> DNA

<213> Homo sapiens

<400> 294

```

ctgtcataaa ctggctctgga gtttctgacg actccttgtt caccaaatgc accatttcct 60
gagacttgct ggcctctccg ttgagtcac ttggctttct gtcctccaca gctccattgc 120
cactgttgat cactagcttt ttcttctgcc cacaccttct tcgactgttg actgcaatgc 180
aaactgcaag aatcaaagcc aaggccaaga gggatgccaa gatgatcagc cattctggaa 240
tttggggtgt ccttatagga ccagagggtg tgtttgtctc accttcttga ctcccatgtg 300
agtgtccatc tgattcagat ccagagtggt tatgggaccc cccactgggg tggaatgtg 360

```

<210> 295

<211> 584

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (558)

<223> n=A,T,C or G

<400> 295

```

cctgagttgg gctgactgcc agagacagac ccctctgggt ctcggtgaac cagccaggca 60
tttacctcag tggttggcac ctggaacctg tccagggccc tcacctgact gaggagccgc 120
cgggcagtgga agtaattgtc caggtctatg ctcttggggg ggataccata gccatccaag 180
gtattcctca ggttctggaa ctgggtctga gtataggcag aactgggccc caggatgatc 240
tcccgagtg ggggaagctg tgaggtcagg taagtatcca cgtccacccg taccccaatc 300
aaactcagca gaatggtgaa ctggagaagt ccttccgtta agtatttctt cagagaaagc 360
attgtgaag gaccagaatg tttatgcttt ttggttttta aaatcttcca aaagacaaat 420
caaggccact gctctgccgc tccagccagc aggttaccct cctcagtgct aaaccccgta 480
ccccaccctg gcagaacaca agggatgagc tccctgacgg cccagagga aagcacaccc 540
tgtggagcca aggccaanga cacactccag accacattca cttt                                     584

```

<210> 296

<211> 287

<212> DNA

<213> Homo sapiens

<400> 296

```

ccttatcatt cattcttagc tcttaattgt tcattttgag ctgaaatgct gcatttttaat 60
tttaacaaaa acatgtctcc tatcctgggt tttgtagcct tcctccacat cctttctaaa 120
caagatttta aagacatgta ggtgtttgtt catctgtaac tctaaaagat cctttttaaa 180
ttcagtccta agaaagagga gtgcttgctc cctaagagtg tttaatggca aggcagccct 240
gtctgaagga cacttctctg ctaagggaga gtgggtatttg cagacta                                     287

```

<210> 297

<211> 457

<212> DNA

<213> Homo sapiens

<400> 297

```
ccaattgaaa caaacagttc tgagaccgtt cttccaccac tgattaagag tggggtggca 60
ggtattaggg ataatttca tttagccttc tgagctttct gggcagactt ggtgaccttg 120
ccagctccag cagccttctt gtccactgct ttgatgacac ccaccgcaac tgtctgtctc 180
atatcacgaa cagcaaagcg acccaaaggt ggatagtctg agaagctctc aacacacatg 240
ggcttgccag gaaccatata aacaatggca gcatcaccag acttcaagaa tttagggcca 300
tcttcagct ttttaccaga acggcgatca atcttttcct tcagctcagc aaacttgcac 360
gcaatgtgag ccgtgtggca atccaatata ggggcatagc cggcgcttat ttggcctgga 420
tggttcagga taatcacctg agcagtgaag ccagacc 457
```

<210> 298

<211> 469

<212> DNA

<213> Homo sapiens

<400> 298

```
tctttgactt tccttgctta cctcctctgg agatctcaaa ttctccaggt tccatgctcc 60
cagagatctc aatgattcct gattctctc tcccaggagt ctgaatgtct cttggttcac 120
tcccacagac tccagtgggt cttgaatttc cttttctaga ggattcattg cccctgatt 180
tatttcttct ggagtcacaa gtgggtgctt agtttctgga gatttcagtg tttccagggt 240
ctcttgctcc gcagacttca gtgattctag gatctctgtt tctaaagatt ttaactgcctc 300
tatgctctct tctttgagtg actttaagaa ctcttgattc tcattttcaa gaggtctagc 360
tatctcctgg tcaagagact tcagtgggtc tagatccact ttttctgggg gtcttaatgt 420
catctgatcc tgttccctta gagacctccg tcgctgttga gtctctttt 469
```

<210> 299

<211> 165

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(165)

<223> n=A,T,C or G

<400> 299

```
tctgtggaga ggatgaggtt gagggaggtg gggatatnctg ctgctctgac cttaggtaga 60
gtcctccaca gaagcatcaa antggactgg cacatatgga ctcccttcac aggccacaat 120
gatgtgtctc tccttcgggc tggncggga tgcacagttg gggta 165
```

<210> 300

<211> 506

<212> DNA

<213> Homo sapiens

<400> 300

```
tctgaggaaa gtttgggctt attagtattt gctccagcga acctccaagt tttctccatt 60
gcggaacaac taactaccag ctccctggct cagtgggtct cctccactca gaagtccca 120
gtaggttctg tcattattgt tggcacatag gcctgaata caggtgatat agggcccca 180
tgagcgctcc tccattgtga aaccaaata agtaccattc attttctggg ctttctccat 240
cacactgagg aagacagaac catttagcac agtgacattg gtgaaatatg tttcattgat 300
```

tctcacagag taattgacgg agatatatga ttgtgagtca ggaggtgtca cagttatagg 360
ctcatcagcg gagatgttga agttacctga agcagagacg caagaagagt ctttggttaat 420
atccaagaag gtctttccca tcagggcagg taagacctgg gctgcagcgt ttggattgct 480
gaatgctcct tgagaaattt ccgtga 506

<210> 301

<211> 304

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(304)

<223> n=A,T,C or G

<400> 301

tcctaaggca gagcccccat cacctcaggc ttctcagttc ccttagccgt cttactcaac 60
tgcccccttc ctctccctca gaatttgtgt ttgctgcctc tatcttgttt tttgtttttt 120
cttctggggg ggggtctagaa cagtgcctgg cacatagtag gcgctcaata aatacttgtt 180
tggtgaatgt ctctctctc ttccactct gggaaaccta ngnttctgcc attctgggtg 240
accctgtatt tntttctggg gccattcca ttgnccagn taatacttcc tcttaaaaaat 300
ctcc 304

<210> 302

<211> 492

<212> DNA

<213> Homo sapiens

<400> 302

ttttcagtaa gcaacttttc catgctctta atgtattcct ttttagtagg aatccggaag 60
tattagattg aatggaaaag cacttgccat ctctgtctag gggtcacaaa ttgaaatggc 120
tcctgtatca catacgagg tcttgtgtat ctgtggcaac agggagtctt cttattcact 180
ctttatttgc tgctgtttaa gttgccaaac tccccctcca ataaaaattc acttacacct 240
cctgcctttg tagttctggg attcacttta ctatgtgata gaagtagcat gttgctgcca 300
gaatacaagc attgcttttg gcaaattaaa gtgcatgtca tttcttaata cactagaaag 360
gggaaataaa ttaaagtaca caagtccaag tctaaaactt tagtactttt ccatgcagat 420
ttgtgcacat gtgagagggg gtccagtttg tctagtgtatt gttattttaga gagttggacc 480
actattgtgt gt 492

<210> 303

<211> 470

<212> DNA

<213> Homo sapiens

<400> 303

tctggggcag caggtactcc ctacggcact agtctacagg gggaaggacg ctctgtgctg 60
gcagcgggtg ctcacatggc ctgtctgcac tgtaaccaca ggctgggatg tagccaggac 120
ttggtctcct tggaagacag gtctgatgtt tggccaatcc agtccttcag accctgcctg 180
aaacttgtat cttacgtgaa cttaaagaat aaaatgcatt tctaccccgga tctcgcccc 240
aggactggca cgacaggccc acggcagatt agatcttttc ccagtactga tcggtgctgtg 300
gaattccagc caccacttct gattcgattc cacagtgate ctgtcctctg agtattttaa 360
agaagccatt gtcaccccgag tcagtgttcc aggagtggc aaccagccag taggggtgtgc 420
cattctccac tccccagccc aggatgcgga tggcatggac ctcgcccgcg 470

<210> 304

<211> 79
<212> DNA
<213> Homo sapiens

<400> 304
tgtccattg ttaactcagc ctcaaattctc aactgtcagg ccctacaaag aaaatggaga 60
gcctcttctg gtggatgcg 79

<210> 305
<211> 476
<212> DNA
<213> Homo sapiens

<400> 305
tcactgagcc accctacagc cagaagagat atgaggaaat tgtaaaggaa gtcagcactt 60
acattaagaa aattggctac aaccccgaca cagtagcatt tgtgccaat tctgggttga 120
atggtgacaa catgctggag ccaagtgcta acgtaagtgg ctttcaagac cattgttaaa 180
aagctctggg aatggcgatt tcatgcttac acaaattggc atgcttgtgt ttcagatgcc 240
ttggttcaag ggaatggaaa tcacccgtaa ggatggcaat gccagtggaa ccacgctgct 300
tgaggctctg gactgcatcc taccaccaac tcgtccaact gacaagccct tgcgcctgcc 360
tctccaggat gtctacaaaa ttggtggtaa gttggctgta aacaaagttg aatttgagtt 420
gatagagtac tgtctgcctt catagggtatt tagtatgctg taaatatttt taggta 480

<210> 306
<211> 404
<212> DNA
<213> Homo sapiens

<400> 306
tctgtctcgg agctcagggc gcagccagca cacacaggag cccacaggac agccacgtct 60
tcacagaaac tacagaagtc aggacccagg cgaggacctc aggaacaagt gccccctgca 120
gacagagaga cgcagtagca acagcttctg aacaactaca taataatgcg gggagaatcc 180
tgaagaccac tgcattccac aagcactgac aaccacttca ggattttatt tcttccactc 240
taacccccag atccatttat gagaagtgag tgaggatggc aggggcatgg aggggtgaagg 300
gacagcaagg atggtctgag ggcttggaaa caatagaaaa tcttcgtcct ttagcatatc 360
ctggactaga aaacaagagt tggagaagag gggggttgat acta 404

<210> 307
<211> 260
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(260)
<223> n=A,T,C or G

<400> 307
tcttgcctan acatctgtga gggcctcaag ggctgctgcc tcgactttct ccctagctaa 60
gtccacccgt ccagggacac agccagggca ctgctctgtg ctgacttcca ctgcagccaa 120
gggtcaaaat gaagcatctg cggaggccag gactccttgg catcggacac agtcagggga 180
aaagccaccc tgactctgca ggacagaggg tctagggtca tttggcagga gaacactggt 240
gtgccaaggg aagcnancat 260

<210> 308

<211> 449
<212> DNA
<213> Homo sapiens

<400> 308
tctgtgctcc cgactcctcc atctcaggta ccaccgactg cactgggagg ggccctctgg 60
ggggaaaggc tccacggggc agggatacat ctcgaggcca gtcacctctt ggaggcagcc 120
caatcaggtc aaagattttg cccaactggg cggcttcaga gttccacag aagagaggct 180
ttcgacgaaa catctctgca aagatacagc caacactcca catgtccaca ggtgttgcac 240
atgtggactg cagaagaact tcgggagctc ggtaccagag tgaacaacc ttgatcgttt 300
cggctggcaa gcctggtggg ggtgccttgt ccagatatgt ccttaggtcc tggctacat 360
gctcaaacac cagggttacc ttgatctccc ggtcagttcg ggatgtggca cagacgtcca 420
tcagccggac aacattggga tgctcaaaa 449

<210> 309
<211> 411
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (384)
<223> n=A,T,C or G

<400> 309
ctgtggaaac ctgggggtgcc gggtaaatgg agaactccag cttggatttc ttgccataat 60
caactgagag acgttccatg agcaggagg tgaaccaga accagttccc ccaccaaagc 120
tgtggaaaac caagaagccc tgaagaccgg tgcactggc agccagcttg cgaattcggc 180
ccaacacaag gtcaatgac tccttgccaa tgggtgtagt ccctcgggca tagttattgg 240
cagcatcttc cttgcctgtg atgagctgct cagggtggaa gagctggcgg taggtgccag 300
tgcgaaacttc atcaatgact gtgggttcca agtctacaaa cacagccgg ggcacgtgct 360
tgccagcgcc cgtctcactt gaanaagggg gtttgaagga agtcatctcc t 420

<210> 310
<211> 320
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (250)
<223> n=A,T,C or G

<400> 310
tcctcgtcca gcttgactcg attagtcctc ataaggtaag caaggcagat ggtggctgac 60
cgggaaatgc ctgcctggca gtggacaaac acccttcctc cagcattctt gatggagtct 120
atgaagtcaa tggcctcggt gaaccaggag ctgatgtctg ccttggtggt gtcctccaca 180
gggatgctct tgtactggta gtgacctca aaatggttgg gacaattggc tgagacgttg 240
atcaaggcan ttatgcccac ggcacccagc atgtccttgc gggaagcgtg atacgcactg 300
cccaggtaca gaaagggcag 320

<210> 311
<211> 539
<212> DNA
<213> Homo sapiens

<400> 311

```

tctggcccat gaagctgaag ttgggagaga tgatgcttcg cctctgcttc acaaactcaa 60
aggcctcgctc cagcttgact cgattagtcc tcataaggta agcaaggcag atgggtggctg 120
accgggaaat gcctgcctgg cagtggacaa acacccttcc tccagcattc ttgatggagt 180
ctatgaagtc aatggcctcg ttgaaccagg agctgatgtc tgcttgtgg ttgtcctcca 240
cagggatgct cttgtactgg tagtgaccct caaaatggtt gggacaattg gctgagacgt 300
tgatcaaggc agttatgccc aaggcatcca gcatgtcctt gcgggaagcg tgatacgcac 360
tgcccaggta cagaaagggc aggatttcca ccggggccacc ctgaaatcca gaaatatcca 420
acattcatca agcttgctca aagccaaggc cagtgcccat acccacaata actttctgct 480
ggaaaagtca atttcagata ccgagtgaac tcagttctgt tgctggagga taaataaat 540

```

<210> 312

<211> 475

<212> DNA

<213> Homo sapiens

<400> 312

```

tcaaggatct tcctaaagcc accatgtgag aggattcgga cgagagtctg agctgtatgg 60
cagaccatgt cctgctgttc tagggcatg actgtgtgta ctctaaagt gccactctca 120
caggggtcag tgataccac tgaacctggc aggaacagtc ctgcagccag aatctgcaag 180
cagcgcctgt atgcaacgtt tagggccaaa ggctgtctgg tggggttgtt catcacagca 240
taatggccta gtaggtcaag gatccagggt gtgaggggct caaagccagg aaaacgaatc 300
ctcaagtcct tcagtagtct gatgagaact ttaactgtgg actgagaagc attttctctg 360
aaccagcggg catgtcggtt ggctgctaag gcactctgca atactttgat atccaaatgg 420
agttctggat ccagtttctg aagattgggt ggcactgttg taatgagat cttca 480

```

<210> 313

<211> 456

<212> DNA

<213> Homo sapiens

<400> 313

```

tccacttaaa ggggtgcctct gccaaactggt ggaatcatcg ccacttccag caccacgcca 60
agcctaacat cttccacaag gatcccgatg tgaacatgct gcacgtgttt gttctgggcg 120
aatggcagcc catcgagtac ggcaagaaga agctgaaata cctgccctac aatcaccagc 180
acgaatactt cttcctgatt gggccgcgcg tgctcatccc catgtatttc cagtaccaga 240
tcatcatgac catgatcgtc cataagaact ggggtggacct ggctggggcc gtcagctact 300
acatccggtt cttcatcacc tacatccctt tctacggcat cctgggagcc ctccctttcc 360
tcaacttcat caggttcttg gagagccact ggtttgtgtg ggtcacacag atgaatcaca 420
tcgtcatgga gattgaccag gaggacctcg gcccg 456

```

<210> 314

<211> 477

<212> DNA

<213> Homo sapiens

<400> 314

```

tgcgtgggct tctggaagcc tggatctgga atcattcacc agattattct ggaaaactat 60
gcgtaccctg gtgttcttct gattggcact gactcccaca cccccaatgg tggcggcctt 120
gggggcatct gcattggagt tgggggtgcc gatgctgtgg atgtcatggc tgggatcccc 180
tgggagctga agtgcctcaa ggtgattggc gtgaagctga cgggctctct ctccggttgg 240
tcctcaccba aagatgtgat cctgaagggt gcaggcatcc tcacggtgaa aggtggcaca 300
gggtgaatcg tggaaatcca cgggcctggt gtgactcca tctcctgcac tggcatggcg 360
acaatctgca acatgggtgc agaaattggg gccaccactt ccgtgttccc ttacaaccac 420

```

aggatgaaga agtatctgag caagaccggc cggaagaca ttgccaatct agctgat 477

<210> 315

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 315

cagggtactgg atgtcaggtc tgcgaaactt cttanatttt gacctcagtc cataaaccac 60
actatcacct cggccatcat atgtgtctac tgtggggaca actggagtga aaacttcggt 120
tgctgcaggt cgtgggaaa atcagtgacc agttcatcag attcatcaga atggtgagac 180
tcatcagact ggtgagaatc atcagtgatc tctacatcat cagagtcgtt cgagtcaatg 240
g 241

<210> 316

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 316

nttntgtgat agtgtggttt atggactgag gncaaaatnt aagaagtttc gcagacctga 60
catccaancc tgcccngcgc gncgctcgaa aggnccaatt ctgcagatat ccatcacact 120
ggcggccgct cgagcatgca tctagagggc ccaattcgcc ctatantgag tnatattaca 180
attcactggc cgtcnnttta caacgtcgtg actgggaaaa ccctggcggt acccaactta 240
a 241

<210> 317

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 317

aggtaccctg ctcancagcc tgggngcctg ggttgtctcc ttgtccatcc actgggtccat 60
tctgtctgc attttttgt tcctcttttg gaggtccac tttgggttg ggctttgaaa 120
ttatagggct acaantacct cggccgaaac cacnctaagg gcgaattctg cagatatcca 180
tcacactggc gncgctcga gcatgcatct agagggccca attcgcccta tagtgagtcg 240
t 241

<210> 318

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 318

```

cgngnacaan ntacattgat gganggtntg nggntctgan tntttantta cantggagca 60
ttaatatattt cttnaacgtn cctcaccttc ctgaantaaa nactctgggt tgtagcgctc 120
tgtgctnana accacntnaa ctttacatcc ctcttttggga ttaatccact gcgcgccac 180
ctctgcccgcg accacgctaa gggcnaattc tgcagatc catcacactg gcggccgctc 240
n                                                                 241

```

<210> 319

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 319

```

caggctactga tcgggtgcgtg gaantccagc caccantnt gattcgattc cacagtgatc 60
ctgtcctctg agtatatttaa agaagccatt gtcacccag tcagtgttcc aggagttggc 120
aaccagccag tagggtgtgc cattctccac tcccagccc aggatgcgga tggcatggcc 180
acccatcatc tctccggtga cgtgttggtg cctcggccgc gaccacgcta agggcgaatt 240
c                                                                 241

```

<210> 320

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 320

```

ggcaggtacc aacagagctt agtaatntct aaaaagaaaa aatgatcttt ttccgacttc 60
taaacaagtg actatactag cataaatcat tctagtaaaa cagctaagggt atagacattc 120
taataatttg ggaaaaccta tgattacaag tgaaaactca gaaatgcaaa gatgttggtt 180
ttttgtttct cagtctgctt tagcttttaa ctctnnnaan cncatgcaca cttgnaactc 240
t                                                                 241

```

<210> 321

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 321
angtaccaac agagcttagt aattnntaaa aagaaaaaat gatctttttc cgacttctaa 60
acaagtgact atactagcat aaatcattct agtaaaacag ctaaggtata gacattctaa 120
taatttgga aaacctatga ttacaagtga aaactcagaa atgcaaagat gttgggtttt 180
tgtttctcag tctgctttag cttttaactc tggaagcgca tgcacacntg aactctgctc 240
a 241

<210> 322
<211> 241
<212> DNA
<213> Homo sapiens

<400> 322
ggtaccaaca gagcttagta atttctaaaa agaaaaaatg atctttttcc gacttctaaa 60
caagtgacta tactagcata aatcattctt ctagtataac agctaaggta tagacattct 120
aataatttgg gaaaacctat gattacaagt aaaaactcag aaatgcaaag atgttggttt 180
tttgtttctc agtctgcttt agcttttaac tctggaagcg catgcacact gaactctgct 240
c 241

<210> 323
<211> 241
<212> DNA
<213> Homo sapiens

<400> 323
cgaggtagctg tcgtatcctc agccttggtc ttttctttta ttttagcttt acagagatta 60
ggtctcaagt tatgagaatc tccatggctt tcaggggcta aacttttctg ccattctttt 120
gctcttaccg ggctcagaag gacatgtcag gtgggatacg tgtttctctt tcagagctga 180
agaaagggtc tgagctgcgg aatcagtaga gaaagccttg gtctcagtga ctcccttggt 240
t 241

<210> 324
<211> 241
<212> DNA
<213> Homo sapiens

<400> 324
aggtagctgc gtatcctcag ccttggttcta tttctttatt ttagctttac agagattagg 60
tctcaagtta tgagaatctc catgggttcc aggggctaaa cttttctgcc attcttttgc 120
tcttaccggg ctccagaagg catgtcaggt gggatacgtg tttctctttc agagctgaag 180
aaagggtctg agctgcggaa tcagtagaga aagccttggt ctccagtgcct ccttggtctt 240
c 241

<210> 325
<211> 241
<212> DNA
<213> Homo sapiens

<400> 325
ggcagggtaca tttgttttgc ccagccatca ctcttttttg tgaggagcct aaatacatcc 60
ttcctgggggt ccagagtccc cattcaaggc agtcaagtta agacactaac ttggcccttt 120

cctgatggaa atatttcctc catagcagaa gttgtgttct gacaagactg agagagttac 180
atgttgggaa aaaaaaagaa gcattaactt agtagaactg aaccaggagc attaagttct 240
g 241

<210> 326

<211> 241

<212> DNA

<213> Homo sapiens

<400> 326

gcaggtacat ttgttttggc cagccatcac tcttttttgt gaggagccta aatacattct 60
tcctgggggtc cagagtcccc attcaaggca gtcaagttaa gacactaact tggccctttc 120
ctgatggaaa tatttcctcc atagcagaag ttgtgttctg acaagactga gagagttaca 180
tgttgggaaa aaaaagaagc attaacttag tagaactgat ccaggagcat taagttctga 240
a 241

<210> 327

<211> 241

<212> DNA

<213> Homo sapiens

<400> 327

ggtaccagac caagtgaatg cgacagggaa ttatttcctg tggtgataat tcatgaagta 60
gaacagtata atcaaaatca attgtatcat cattagtttt cactgcctc acactagtga 120
gctgtgccaa gtagtagtgt gacacctgtg ttgtcatttc ccacatcacg taagagcttc 180
caaggaaaagc caaatcccag atgagtctca gagagggatc aatatgtcca tgattatcag 240
g 241

<210> 328

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 328

ggtacnagac caaatgaang ccacagggaa ttatttcctg tggtgataat tcatgaagta 60
gaacantata atcaaaatca attgtatcat cattagtttt cactgcctc acactagtga 120
gctgtgccaa gtagtagtgt gacacctgtg ttgtcatttc ccacatcacg taagagcttc 180
caaggaaaagc caaatcccag atgagtctca gagagggatc aatatgtcca tnatcatcan 240
g 241

<210> 329

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

100

<400> 329

```
ttcagggtcga gttggctgca gatttgtggt gcnttctgag ccgtctgtcc tgcgccaaaa 60
ngcttcaaag tattattaaa aacatatgga tccccatgaa gccctactac accaaagttt 120
accaggagat ttggatagga atggggctga tgggcttcat cgtttataaa atccgggctg 180
ctgataagaa gtaaggcttt gaaagcttca gcgcctgctn ctggtcanna ctaaccatan 240
n 241
```

<210> 330

<211> 241

<212> DNA

<213> Homo sapiens

<400> 330

```
ttttgtgcag atttgtggtg cgttctgagc cgtctgtcct gcgccaaagat gcttcaaagt 60
attattaaaa acatatggat ccccatgaag ccctactaca ccaaagtta ccaggagatt 120
tggataggaa tggggctgat gggcttcacg gtttataaaa tccgggctgc tgataaaaga 180
agtaaggctt tgaaagcttc agcgcctgct cctggctacg actaaccaga tttacttgga 240
g 241
```

<210> 331

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1) ... (241)

<223> n = A,T,C or G

<400> 331

```
nttttaggna ctttgggctc cagacttcac tggctcttagg nattgaaacc atcacctggn 60
ntgcattcct catgactgag gttaacttaa aacaaaaatg gtaggaaagc tttcctatnc 120
ttcnggtaag anacaaatnt nctttaaaaa aangtggaag gcatgacnta cgtgagaact 180
gcacaaactg gccactgaca aaaatgaccc ccatttgtgt gacttcattg agacacatta 240
c 241
```

<210> 332

<211> 241

<212> DNA

<213> Homo sapiens

<400> 332

```
tgtgaggaga gggaacatgc tgagaaactg atgaagctgc agaaccaacg aggtggccga 60
atcttccttc aggatatcaa gaaaccagac tgtgatgact gggagagcgg gctgaatgca 120
atggagtgtg cattacattt ggaaaaaaat gtgaatcagt cactactgga actgcacaaa 180
ctggccactg acaaaaatga cccccatttg tgtgacttca ttgagacaca ttacctgaat 240
g 241
```

<210> 333

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature


```
<222> (1) ... (241)
<223> n = A,T,C or G
```

```
<400> 333
cagggtacaag cttttttttt tttttttttt tttttttttt ttgnaaatat tntttattgn 60
aaatatctta tcctaaattc catatagcca attaatntt acanaatntt ttgttaattt 120
ttgngngtat aaattttaca aaaataaagg gtatgtttgt tgcacacaac ttacaaataa 180
taataaaactn tttattgnaa atattnttta ttgnaaatat tctttatcct aaattccata 240
r                                                    241
```

```
<210> 334
<211> 241
<212> DNA
<213> Homo sapiens
```

```
<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G
```

```
<400> 334
tacctgctgn aggggntgaa gncntctctg ctgccccagg catctgcanc ccttgctgct 60
ggttctgccc ctgctgcagc agaggagaag aaagatgaga agaaggagga gtctgaagag 120
tcagatgatg acatgggatt tggccttttt gattaaannc ctgctcccct gcaaataaag 180
cctttttaca caaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aagcttgtag ctgccnnggc 240
q 241
```

```
<210> 335
<211> 241
<212> DNA
<213> Homo sapiens
```

```
<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G
```

```
<400> 335
ctatgtgctg ggatgactat ggagacccaa atgtctcana atgtatgtcc cagaaacctg 60
tggctgcttc aaccattgac agttttgctg ctgctggctt ctgcagacag tcaagctgca 120
gctccccc aaaggctgtgct gaaacttgag ccccgctgga tcaacgtgct ccaggaggac 180
ctctgtgactc tgacatgcc a ggggggctcgc agccctgaga gcgactccat tcagtgggtc 240
c 241
```

```
<210> 336
<211> 241
<212> DNA
<213> Homo sapiens
```

```
<400> 336
taccaaccta tgcagccaag caacctcagc agttcccatac aaggccacct ccaccacaac 60
cgaaagtatc atctcagggg aacttaattc ctgcccgctc tgctcctgca ctccttttat 120
atagttccct cacttgattt ttttaacctt ctttttgcaa atgtcttcag ggaactgagc 180
taataactttt ttttttcttg atgttttctt gaaaagcctt tctgttgcaa ctatgaatga 240
a 241
```

<210> 337
<211> 241
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 337
ggtagctgtat gtagctgcac tacaacagat tcttaccgtc tccacanagg tcatanattg 60
taaagtgtga atactgactt tttttttatt ccttgactc aagacagcta acttcatttt 120
cagaactgtt ttaaactttt gtgtgctggt ttataaaata atgtgtgtaa tccttggtgc 180
tttcttgata ccagactgtt tcccgtggtt ggtagaata tattttgntt tgatgcttat 240
a 241

<210> 338
<211> 241
<212> DNA
<213> Homo sapiens

<400> 338
aggtacaggt gtgcgctgag ccgagtttac acggaagga taaagcccat ttagtttttt 60
ctcaaatgga gttttccact ttcttttgaa gtagacagca ttcaccagga tcatcctggt 120
atccccatct acagaacctt caggtaacaa gtttgggatt ttgccttttg tttgagtctt 180
gaccagga ttaatttttt ttctagcttc ttctgcacat tctaggaagt ctactgcctg 240
g 241

<210> 339
<211> 241
<212> DNA
<213> Homo sapiens

<400> 339
taccgacggc tcctggaggg agagagtga gggacacggg aagaatcaaa gtcgagcatg 60
aaagtgtctg caactccaaa gatcaaggcc ataaccagg agaccatcaa cggaagatta 120
gttctttgtc aagtgaatga aatccaaaag cacgcatgag accaatgaaa gtttccgcct 180
gttgtaaaat ctattttccc ccaaggaaa gtcctgcaca gacaccagtg agtgagttct 240
a 241

<210> 340
<211> 241
<212> DNA
<213> Homo sapiens

<400> 340
gtagccttca cacacacatg cccgtaacag gatttatcac aagacacgcc tgcattgata 60
ccagacacag ggcgtatgga aagcacgtcc tcaagactgt agtattccag atgagctgca 120
gatgcttacc taccacggcc gtctccacca gaaaaccatc gccaaactct gcgatcagct 180
tgtgacttac aaacctgtt taaaagctgc ttacatggac ttctgtcctt taaaagcttc 240
c 241

<210> 341

<211> 241
<212> DNA
<213> Homo sapiens

<400> 341
gtaccgccta ctttcgtctc atgtctccga acttcttgct gatggccgtt ccaacgttgc 60
tgaaagctgc agttgccttt tgccctgcgt gactcagggg ttcattgtgt ttcttgtagg 120
cagtggtagt ctgcatgtca tgccagcttt tgctgaagtt ctgttttaac tcattcatca 180
ggttcatgcc gagttttgtt ttatctcaac tagatgcctt tctttcgctg acaaaacttg 240
t 241

<210> 342
<211> 241
<212> DNA
<213> Homo sapiens

<400> 342
gtacattggg gctataaata taaatgctac ttatgaagca tgaaattaag cttctttttt 60
cttcaagttt tttctcttgt ctagcaatct gttaggcttc tgaaccaaga ccaaagtgtt 120
acgttcctct gctgcatacc aacgttactc caaacaataa aaatctatca tttctgctct 180
gtgctgagga atggaaaatg aaacccccac cccctgaccc ctaggactat acagtggaaa 240
c 241

<210> 343
<211> 241
<212> DNA
<213> Homo sapiens

<400> 343
gtacatgtgg tagcagtaat ttttttgaag caactgcact gacattcatt tgagtgttct 60
ctcattatca gattctgttc caaacaagta ttctgtagat ccaaattggat taccagtgtg 120
ctacagactt cttattatag aacagcattc tattctacat caaaaatagt ttgtgtaagt 180
tagttttggg taccatctaa aatattttta aatgttcttt acataaaaaa ttatgttggtg 240
t 241

<210> 344
<211> 241
<212> DNA
<213> Homo sapiens

<400> 344
ggtacaaaat tggttgaatt tagctaataa aaaaacatag,taaatattta caaaaacgtt 60
gataacatta ctcaagtcac acacatataa caatgtagac aggtcttaac aaagtttaca 120
aattgaaatt atggagattt cccaaaatga atctaatagc tcattgctga gcatggttat 180
caatataaca ttttaagatct tggatcaaat gttgtccccg agtcttctgc aatccagtcc 240
t 241

<210> 345
<211> 241
<212> DNA
<213> Homo sapiens

<400> 345
ggtacgaagc tgagcgacag ggggttgccc cagcgtggag cctggacctc aaacttcacg 60
gaaaaatgctc tctctctttg acaggcttcc agctgtctcc taatttcttg gatgaactct 120

104

ccccggcgat ttaactgac ctgaaaagtg gtgagaggac tgaggaagac aaccagggtca 180
gcgttagatc ggcctctgag ggtggtgccc ttgcttgagg agccaccctt taccaccttg 240
g 241

<210> 346

<211> 241

<212> DNA

<213> Homo sapiens

<400> 346

caggtaccac tgagcctgag atggggatga gggcagagag aggggagccc cctcttccac 60
tcagtgttct ctactcagac tgttgcactc taaacctagg gaggttgaag aatgagaccc 120
ttagggtttta acacgaatcc tgacaccacc atctataggg tcccaacttg gttattgtag 180
gcaaccttcc ctctctcctt ggtgaagaac atcccaagcc agaaagaagt taactacagt 240
g 241

<210> 347

<211> 241

<212> DNA

<213> Homo sapiens

<400> 347

aggatcatct aaaggcatga agcactcaat tgggcaatta acattagtgt ttgttctctg 60
atggtatctc tgagaatact ggttgttaga ctggccagta gtgccttcgg gactgggttc 120
accccagggt ctgcggcagt tgtcacagcg ccagccccgc tggcctccaa agcatgtgca 180
ggagcaaatg gcaccgagat attccttctg ccactgttct cctacgtggt atgtcttccc 240
a 241

<210> 348

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 348

angtacttgg caagattnga tgctcttgng ctcantgaca tcattcataa cttgttngtg 60
tgancagagg aggagnncat catentgtcc tcattcgtca gnnncctctc ctctctgaat 120
ctcaaacaag ttgataatgg agaaaaattt gaattctcag gattgaggct ggactgggtc 180
gcctacang catacactag cgtgggctaag gccctctctg accctgcatg anaaccctga 240
c 241

<210> 349

<211> 241

<212> DNA

<213> Homo sapiens

<400> 349

gcagggtacca tttgtctgac ctctgtaaaa aatgtgatcc tacagaagtg gagctggata 60
atcagatagt tactgtacc cagagcaata tctgtgatga agacagtgtc acagagacct 120
gtcacactta tgacagaaac aagtgtctaca cagctgtggt cccactcgta tatgggtggtg 180
agacccaaat ggtggaaaca gccttaaccc cagatgcctg ctatcctgac taatttaagt 240

c 241

<210> 350

<211> 241

<212> DNA

<213> Homo sapiens

<400> 350

aggtactgtg gatatttaaa atatcacagt aacaagatca tgcttggtcc tacagtattg 60
cgggccagac acttaagtga aagcagaagt gtttgggtga ctttcctact taaaattttg 120
gtcatatcat ttcaaaacat ttgcatcttg gttggctgca tatgctttcc tattgatccc 180
aaaccaaadc ttagaatcac ttcattttaa atactgagcg gtattgaata cttcgaagca 240
g 241

<210> 351

<211> 241

<212> DNA

<213> Homo sapiens

<400> 351

tacagaaadc atttgagacc gttttgagac agaagtagag gctctgtcaa gtcaatactg 60
cattgcagct tggccactg aagaagccac gcctgagata caaaagatgc actacacttg 120
acccgcttta tgctcgcttc ctctcccttc ctctctcatc aactttatta gggtaaaaa 180
ccacatacag gctttctcca aatgactccc tatgtctggg gtttggttag aattttatgc 240
c 241

<210> 352

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 352

gtaccctgtn gagctgcacc aagattannt ggggccatca tgactgcanc cacnagang 60
acgcaggcgt gnagtgcacg gtctgacccg gaaacccttc cacttctctg ctcccagagg 120
gtcctcnggc tcatatgtgg gaaggcanan gatctctgan gagttnccctg gggacaactg 180
ancagcctct ggagaggggc cattaataaa gctcaacatc attggcaaaa aaaaaaaaaa 240
a 241

<210> 353

<211> 241

<212> DNA

<213> Homo sapiens

<400> 353

aggtaccagt gcattaatct gggcaaggaa agtgtcataa tttgatactg tatctgtttt 60
ccttcaaagt atagagcttt tggggaagga aagtattgaa ctgggggttg gtctggccta 120
ctgggctgac attaaactaca attatgggaa atgcaaaaagt tggttgata tggtagtg 180
tggttctctt ttggaatctt tttcagggtga ttaataata atttaaaact actataaaaa 240
c 241

106

<210> 354
<211> 241
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 354
ngcaggtccg ggcaggtacc aagattcatt ctcatacaaaa actagaaaca gaagggcaaa 60
ttccagtttc cttctgggat tgaatacttt caagtaaggt cttcgacaaa caatcagggg 120
gccaattaat ccactgtaga ggtccctaac ttgatccaca gttgaataat aagcccatgg 180
aatacaagca gaatcctctg ttccagctcc agatctttct gggattttcc atacgtaagt 240
g 241

<210> 355
<211> 241
<212> DNA
<213> Homo sapiens

<400> 355
ggtacccacc ctaaatttga actcttatca agaggctgat gaatctgacc atcaaataagg 60
ataggatgga cttttttttg agttcattgt ataaacaaat tttctgattt ggacttaatt 120
cccaaaggat taggtctact cctgctcatt cactctttca aagctctgtc cactctaact 180
tttctccagt gtcatagata gggaattgct cactgcgtgc ctactctttc ttcacttacc 240
t 241

<210> 356
<211> 241
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 356
aggtactgta attgagcatc cggaatntgg agaagtaatt tagctacagg gtgaccaacg 60
caagaacata tgccagttcc tcgtagagat tggactggct aaggacgata agctgaagg 120
tcattgggtt taagtgcttg tggctcactg aagcttaagt gaggatttcc ttgcaatgag 180
tagaatttcc cttctctccc ttgtcacagg tttaaaaacc tcacagcttg tataatgtaa 240
c 241

<210> 357
<211> 241
<212> DNA
<213> Homo sapiens

<400> 357
ttttgtacca ccgatatgat caaggaaaa tctgcccatt tttatggctg aagttctaaa 60
aacctaattc aaagtcttc catgatccta cactgcctcc aagatggctc aggcctggcat 120
aaggcctgag cggcggtgag atccgcggct gccagcagct tgctgctctt cagctgggat 180

107

gaagccctc ggccaccga gtctccagga cctgcccggg cgccgctcga aagggcgaat 240
t 241

<210> 358
<211> 241
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 358
aggtacgggg agtgggggtg aagcntgttc tctacatagg caacacagcc gcctaantca 60
caaagtcagt ggtcgccgc ttcgaccaac atgtggtgag cattccacgg gcgcatgaag 120
tctgggtgct gtgctcgagt ctctgaatat tttgatagga agcgacaaga aaattcaaac 180
tgctctttgc tgactactgg aaagtgaaaa gatgctcaag tttaccattc aaagaaacca 240
t 241

<210> 359
<211> 241
<212> DNA
<213> Homo sapiens

<400> 359
gaggtacaca aaaggaatac cttctgagag ccaggaggag aggaaagggg aaggagactt 60
gacgtcaagg gtgcttttga ggaacatgac gggccagcca gcctgcccga actttgaggc 120
cctgctgggc tcttgtgact ataaatatac tgtctatttc taatgcaatc cgtctttcct 180
gaaagatctt gttatctttt actattgaga catgctttca tttttgtggc cctgtttcca 240
a 241

<210> 360
<211> 241
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 360
ngtactctat actaattctg cttttttata cttaattcta aatttctccc ctctaattta 60
caacaaattt tgtgattttt ataagaatct atgcctcccc aattctcaga ttcttctctt 120
ttctccttta tttctttgct taaattcagt ataagctttc ttggattttt aggcttcattg 180
cacattctta ttcttaaaca ccagcagttc ttcagagacc taaaatccag tataggaata 240
a 241

<210> 361
<211> 241
<212> DNA
<213> Homo sapiens

<400> 361

108

```
aggctactctc cgtgccccga cactgaacat tatccagcca gatctgcccc gtgccagctc 60
ccacttttgta cttttctttac tatcctgtct agaatcatgt cttatgattt taacagatat 120
agaaccactc ctagaaaatg ttctttcact ttctcgtttc ctttttaatc tatcatcctg 180
actactgaac ttaaaatctt tttcttcctt tttttgtttc tcttttcttt tatcctgttc 240
a 241
```

<210> 362

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 362

```
aggctactttt atacctngct tangtcagtg acagattttac caatgacaac acaatttttaa 60
aattccaaca catatattac tttgtcctat gaagggcaaa aagtcaatat attttaaatt 120
ttaaaaacag aatggatata atgacctttt tacacatcag tgatatttaa aagacttaaa 180
gagacaatac tatggttgag aacttggtt cctattccag ccctaattaa agaaaaaata 240
g 241
```

<210> 363

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 363

```
ttangtacta aaaacaaaat cctaattctg ttttaaagag ctgggagatg ttaatcatat 60
gctcagtttt tccacgttat aatttcctaa atgcaaactt ttcaatcagg gcagttcaaa 120
ttcattacat cacagtaa ataacagtagcc aactttgatt ttatgcttat aggaaaaaaa 180
atcctgtaga tataaaaaca gcaaattttg acaaataaaa ctcaaaccat tcattccctaa 240
a 241
```

<210> 364

<211> 241

<212> DNA

<213> Homo sapiens

<400> 364

```
ggtacaagca gttagtcttg aaggcccttg ataagaatgt catcttctcc ccactgagca 60
tctccaccgc cttggccttc ctgtctctgg gggcccataa taccaccctg acagagattc 120
tcaaaggcct caagttaaac ctcacggaga cttctgaggc agaaattcac cagagcttcc 180
agcacctcct gcgcaccctc aatcagtcca gcgatgagct gcagctgagt atgggaaatg 240
c 241
```

<210> 365

<211> 241

<212> DNA

<213> Homo sapiens

<400> 365

```
cgaggtagctg agattacagg catgagccac cacgcccggc caaaaacatt taaaaaatga 60
ctgtccctgc tcaaatactg cagtaggaaa tgtaatttga catatatcac ttccagaaaa 120
aaacttttaa tctttctata aaatgaattt gatacatcat cagcatgaag tgaagttaaa 180
atctcttaca aagtaaattc aggtatatca acaatgagat ccaaaagtat cggttcaaga 240
t                                                                 241
```

<210> 366

<211> 241

<212> DNA

<213> Homo sapiens

<400> 366

```
ggcaggtaca catcaaacac ttcattgcct aaatgcaggg acatgcttcc atctgaccac 60
ttgactatcc gagcattgct ttctttaatt tcatttcctt cttcatctcg gcgtatcctc 120
catcttatag tattttctac ctttaatttt aacctgggtc taccttcttc atccagcatt 180
tcttcatctt caaattcatc ttcataatac tgggctctac acttgagaaa gttgggcagt 240
t                                                                 241
```

<210> 367

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 367

```
gcaggtacaa ataattcctg ttgtnacatt tagtggacgc gattatctgt atacctcaaa 60
ttttaattta agaaagtatc acttaaagag catctcattt tctatagatt gaggcttaat 120
tactgaaaag tgactcaacc aaaaagcaca taacctttta aaggagctac acctaccgca 180
gaaagtcaga tgccctgtaa ataactttgg tctttcaaaa tagtggcaat gcttaagata 240
c                                                                 241
```

<210> 368

<211> 241

<212> DNA

<213> Homo sapiens

<400> 368

```
tttgtacatt gttaatagtg accctcggag gaaatggatt tctcttctat taaaaactct 60
atgggtatata agcattacat aataatgcta cttaaccacc ttttgtctca agaattatca 120
ccaaagtgtt ctggaaataa gtccacataa gaattaaata tttaaaaggt gaaatgttcc 180
ttattttaac tttagcaaga tcttttcttt ttcattaaga aacactttaa taatttttaa 240
g                                                                 241
```

<210> 369

<211> 241

<212> DNA

<213> Homo sapiens

110

<400> 369

```
gcagggtactt tattcttatt tcttatccta tattctgtgt tacagaaaaa ctactaccat 60
aaacaaaaca ccaaccagcc acagcagttg tgtcaagcat gacaattggg ctagtcttca 120
cattttatta gtaagtctat caagtaagag atgaaggggc tagaaaacta gacacaaagc 180
aaccaggggc caaatcacca aggtagatct gtgcttagct aaaggggaaac acccgaagat 240
t                                                                 241
```

<210> 370

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 370

```
ngttcacagt gcccctccgg cctcgccatg aggtctttcc tgcgctccc ggtcctgggtg 60
gtggttctgt cgatcgctctt ggaaggccca gcccagccc aggggacccc agacgtctcc 120
agtgccttgg ataagctgaa ggagttagga aacacactgg aggacaaggc tcgggaactc 180
atcagccgca tcaaacagag tgaactttct gccaaagatgc gggagtgggtt ttcagaagac 240
a                                                                 241
```

<210> 371

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 371

```
ggcaggtcat cttgagcctt gcacatgata ctcagattcc tcacccttgc ttaggagtaa 60
aacaatatac ttacagggt gataataatc tccatagtta tttgaagtgg cttgaaaaag 120
gcaagattga cttttatgac attggataaa atctacaaat cagccctcga gttattcaat 180
gataactgac aaactaaatt atttccttag aaaggaagat gaaaggnagt ggagtgtggt 240
t                                                                 241
```

<210> 372

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 372

```
aggtacagca aagcgaccct tggtgnnata gatcagacgg aaattctctc ccgtcttgnc 60
aatgctgatg acatccatga atccagcagg gtaggttata tcagttcgga ccttgccatc 120
gattttaatg aaccgctgca tgcaaatctt ctttacttca tctcctgtca gggcatactt 180
```

111

aagctctgttc ctcaggaaaa tgatgagggg gagacactct ctcaacttgt ggggaccggg 240
g 241

<210> 373

<211> 241

<212> DNA

<213> Homo sapiens

<400> 373

tactgaaaca gaaaaaatgt attcccacaa aagctgttac acagcggttt cccgtcccca 60
gaagcagtag aaaatcttag cattccaatg gaaggcatgt atttgtaaaa tattctaaaa 120
tcagctctat agtttccttg tcctcttga taagggatca gacagagggg gtgtccccct 180
tcagcagcta cccttcttga caaactgggc tccaataata cctttcagaa acttacaaga 240
c 241

<210> 374

<211> 241

<212> DNA

<213> Homo sapiens

<400> 374

caggtaactaa aacttacaat aaatatcaga gaagccgtta gtttttacag catcgtctgc 60
ttaaaagcta agttgaccag gtgcataatt tcccatcagt ctgtccttgt agtaggcagg 120
gcaatttctg ttttcatgat cggaatactc aaatatatcc aaacatcttt taaaacttt 180
gatttatagc tcctagaaag ttatgttttt taatagtcac tctactctaa tcaggcctag 240
c 241

<210> 375

<211> 241

<212> DNA

<213> Homo sapiens

<400> 375

aggtacaaag gaccagtatc cctacctgaa gtctgtgtgt gagatggcag agaacgggtgt 60
gaagaccatc acctccgtgg ccatgaccag tgctctgccc atcatccaga agctagagcc 120
gcaaattgca gttgccaaata cctatgcctg taaggggcta gacaggattg aggagagact 180
gcctattctg aatcagccat caactcagat tgttgccaat gccaaaggcg ctgtgactgg 240
g 241

<210> 376

<211> 241

<212> DNA

<213> Homo sapiens

<400> 376

ggtacatttt actttccttc tttcagaatg ctaataaaaa acttttgttt atacttaaaa 60
aaaccataaa tcagacaaac aaaagaaacg attccaacat cacttctgtg atgagaaaag 120
aggcaatgga attcaacata agcaaagaaa actctacctg gaggaagaa atcgatcagc 180
gaagaaacaa ctcggggctg ctgccagact gcaggccatg cgaggaggag cctcctagag 240
g 241

<210> 377

<211> 241

<212> DNA

<213> Homo sapiens

112

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 377
tcctttctgt ccaggtgatt cacagactag acctttctta tcctcctcct agagttttga 60
cttgggactc tagtgtaag atgatgagcc cgtgcatcag gtccttctgc actttggtgg 120
aagtctccca gggtaggttt cctatttgaa acagtggaat catgtttcca gtgataaagt 180
ttaatgacct catccttttt tttttttttc tcacttgcca tttgtgtgtc ttanatgggt 240
t 241

<210> 378
<211> 241
<212> DNA
<213> Homo sapiens

<400> 378
aggtcagcga tcaggtcctt tatgggcagc tgctgggcag cccacaagc ccagggccag 60
ggcactatct ccgctgcgac tccactcagc cctcttggc gggcctcacc ccagcccca 120
agtcctatga gaacctctgg ttccaggcca gcccttggg gaccctggta accccagccc 180
caagccagga ggacgactgt gtctttgggc cactgctcaa cttccccctc ctgcagggga 240
t 241

<210> 379
<211> 241
<212> DNA
<213> Homo sapiens

<400> 379
tacggagcaa tcgaagaggc atatccacac ttgggggtggc tatagggtctg gaaaatgctg 60
aagatgactg ctttctactga ggtcaaggat tgtaatatgt ccagctttgt aaagccatta 120
aagcagaagt ttcttcagtg atcttctctc taagaaacac catcacctcc atgtgcctta 180
cagaggcccc ctgcttctct ctgcattgct tttgcgcaat cccttgatga tgaagatggg 240
c 241

<210> 380
<211> 241
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 380
acgtacacgc agaccgacat gggnnnttca ggcntnagat caaactcaaa acctgnaatg 60
atatccactc tctttttctt aagctcaggg aaatatcca agtagaagtc canaaagtca 120
tcggctaana tgcttcngaa tttgaattca tgcacatagg ccttgaaaaa actgtcaaac 180
tgannctgat caccaccaa gtgggccttn tatgacacaa agcagaaacc tttctctntan 240
g 241

<210> 381

<211> 241
<212> DNA
<213> Homo sapiens

<400> 381
aggtacaact taatggatta gcttttgggt ttaactgaat atatgaagaa attgggtctg 60
tctaaagaga gggatattca tatggctttt agttcacttg tttgtatttc atcttgattt 120
ttttcttttg aaaataaagc attctatttg gttcagattt ctcagatttg aaaaaggctc 180
tatctcagat gtagtaaatt atttcctttc agtttctgaa agcaggattt gactctgaaa 240
g 241

<210> 382
<211> 241
<212> DNA
<213> Homo sapiens

<400> 382
gtactgctat aatcaatacg tctgatagac aggtttatcc actatattga ccctacctct 60
aaaaggattg tcataattta tatgctttat gtttacacct atgatacagt tgccttggaa 120
cacaaaattt ttcattgtaa ttaaaaaaag aagagttgtg cagacagaag aaatcaaadc 180
taagaaaadc acaggagtag ataaatactc tagaattcat atacccttgg aagatgggtt 240
t 241

<210> 383
<211> 241
<212> DNA
<213> Homo sapiens

<400> 383
ggcaggtaca aagtcttctc tttgcttttt ataattttaa agcaaataac acatttaact 60
gtattttaagt ctgtgcaaata aatccttcag aagaaatadc caagattctg tttgcagagg 120
tcattttgtc tctcaaagat gattaaatga gttcgtcttc agataaagtg ctccctgtcca 180
gcagaactca aaaggccttc aagctgttca gtaagtgtag ttcagataag actccgtcat 240
a 241

<210> 384
<211> 241
<212> DNA
<213> Homo sapiens

<400> 384
ggtacacaaa atacacttgc aagcttgctt acagagacct gttaaacaaa gaacagacag 60
attctataaa atcagttata tcaacatata aaggagtgtg attttcagtt tgttttttta 120
agtaaataatg accaaactga ctaaataaga aggcacaaaca aaaaattatg cttccttgac 180
aaggcctttg gagttaaaca aatgctttaa ggctcctggg gaatgggggt gcaaggatga 240
a 241

<210> 385
<211> 241
<212> DNA
<213> Homo sapiens

<400> 385
ggcaggtcta caatggctct gtccttcttg tggaaatcgtt acaccaagag gtctcagtc 60
tggtccttga cccacagtg agctgttttag atgaccttc acatcttcct gatcaactgg 120

114

aagacactcc aatcctcagt gaagactctc tggagccctt caactctctg gcaccaggta 180
ggtttggagg ctatgtccct ttaacttata catgcagagt agccaaactt tacctgaaag 240
a 241

<210> 386

<211> 241

<212> DNA

<213> Homo sapiens

<400> 386

aggtaccttt ttcctctcca aaggaacagt ttctaaagtt ttctgggggg aaaaaaact 60
tacatcaaatt ttaaaccata tgtaaactg catattagtt gtgttacacc aaaaaattgc 120
ctcagctgat ctacacaagt ttcaaagtca ttaatgcttg atataaattt actcaacatt 180
aaattatctt aaattattaa ttaaaaaaaa aactttctaa gggaaaaata aacaaatgta 240
g 241

<210> 387

<211> 241

<212> DNA

<213> Homo sapiens

<400> 387

acccacttgg ccgctgtgga gtatctccac tctccctctg tgagggccgc tcccaccgac 60
cagtcgaact ttcgtaaagt gagttaatgt gtttccactc cctttttccc ctttctggcc 120
ttttgggtcca gaatttcctg gccttcgggc atatcctggg agtcctcgac ttccaggaaa 180
gccaaattgct ccccgatcac ctttaagacc cggaggacct attggacctg gaaatcctcg 240
t 241

<210> 388

<211> 241

<212> DNA

<213> Homo sapiens

<400> 388

tttgtaactt tgtccacagc agagacattg agtataccat tggcatcaat gtcaaaagtg 60
acttcaatct gaggaacacc tcggggtgca ggagggtatgc ctgtgagttc aaacttgcca 120
agcagggtgt tatcctttgt catggcacgc tcgccttcat aaacctgaat aagtacacca 180
ggctggttgt cagaataggt agtgaaggtc tgtgtctgct tggttaggaat ggtggtatta 240
c 241

<210> 389

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 389

tacctntggt agtgagcacc ttgtcttntg tgcttatntc ttnaagataa atacatggaa 60
ggatgtgaaa atcggaaacac caactatgtg tctcactgca tctaagtga gacgccacag 120
ctgtgagagt tttcaaagca gaaagatgct gatgtgacct ctggaattca gacatactga 180
gctatgggtc agaagtgttt tacttaaaaa gcaacaatc cccaggaaat actgaatagg 240

a 241

<210> 390
<211> 241
<212> DNA
<213> Homo sapiens

<400> 390
gcaggtagat ccacatgttc ctccaaatga cgtttgggggt cctgcttgcc aacattcttt 60
attgccagct gtccaggtgt catcttatct tcttcttcta cagccttatt gtaattcttg 120
gctaattcca acatctcttt taccactgat tcattgcgtt tacaatgttc actgtagtcc 180
tgaagtgtca aaccttccat ccaactcttc ttatgcaaat ttagcaacat cttctgttcc 240
a 241

<210> 391
<211> 241
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 391
cnggcacaan cctntgtttt tnnntttttt tttttttttn tctttatttn tttttantnt 60
taanaaaaaa nnttannnaa annnggggtt aaatnctntn nncagancat taaaactgaa 120
ggggaaaaaa aaaccaaaaa cgagcttntt anttnacntg ggnttgggnn gntgctgatn 180
tnaagaagca anntttanan cnngcnnnat ganngagngn tcannttgaa atttnnacc 240
t 241

<210> 392
<211> 241
<212> DNA
<213> Homo sapiens

<400> 392
gaggtagtaa atggtagtct tagattaaaa ttttgtgctt gataacagct gttttttcta 60
cattagaaat aagatgccac acaaggaact acattccaga tttaaagaaa tgaaaggata 120
ccattagtgt gtataacaga ttattgttca tacttgtaaa gcattctatg tcattgagaa 180
tataaagaac agtgccttag aagacagtga aaggtaagct ctagcttaat gtctatgatt 240
t 241

<210> 393
<211> 241
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 393
ggcaggtaga taagcataat cagttatgga cagcttcttg tataaattgc tattcancaa 60

116

tacataaaact gcctnaaaga tttatgctta caggtagaca ttcaatttac caataaaaaca 120
gcatgttctg aaaatatggg cacattttaaa aacatattaa gacagttctg ttaaccataa 180
tagtcccaca gtatgactga gtaataagaa tctacttcaa aagnaaaaaa aaaattaatc 240
a 241

<210> 394

<211> 241

<212> DNA

<213> Homo sapiens

<400> 394

aggtacagca gcagtagatg gctgcaacaa ccttcctcct accccagccc agaaaatatt 60
tctgcccac ccaggatcc gggacaaaaa taaagagcaa gcaggcccc ttcactgagg 120
tgctgggtag ggctcagtgc cacattactg tgctttgaga aagagggaagg ggatttgttt 180
ggcactttaa aaatagagga gtaagcagga ctggagaggc cagagaagat accaaaattg 240
g 241

<210> 395

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 395

nggcnggnnc caanatatga aatntnanta tnatacatga tnaaaagctt tatntatttt 60
agtgaagtaat taagtttaca ctgtgaataa ggattaattc ccagatgacc atctacagtt 120
actaccacat agagggtata cacggatgga tcgattacaa gaatataaaa cttattttcc 180
ttcctgtatc cacatttctt tgcaatgtga atttgcaggc cctctcaaga agtggagtct 240
a 241

<210> 396

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 396

gaggtagacc ttgaatgaca atgctnggag cccccctgtg gtcacgacg cctccactgc 60
cattgatgca ccaccaacc tgcgtttcct ggccaccaca cccaattcct tgctgggtatc 120
atggcagccg ccacgtgccg ggattaccgg ctacatcatc aagtatgaga agcctgggtc 180
tcctcccaga gaagtggtec ctcggtcccg ccctgggtgtc acagaggcta ctattactgg 240
c 241

<210> 397

<211> 241

<212> DNA

<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 397
ggcaggtacc agcaggggga tgtgtttctg ggggaattgtg gctctggaag cttcacggtt 60
tcccagaatg tggaaaatat atctgtgcan gatagaaatc ctgcccagag gctgtttctg 120
tctcatttga gctctccttc atgtggcaga gctgactgtg gcggtttagg agcctacatt 180
ttagaaaagc ttacctcaaa gttctgcatt gagcctgagc actggaaagg agataaaata 240
a 241

<210> 398
<211> 241
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 398
gangtgacca ngacatcacc tnacacntgg aaagcganga nttgaatggt gcntacaang 60
ccntaccnt tgcccannac ctgaacgcgc ctnttgattg ggacagccgt gggaaggaca 120
gttatgaaac nantcanctg gatgaccana gtgntgaaac cnacanncac angcnntcna 180
cattatataa ncggaaagct aatgatgaga gcaatgatca ttccgatgtn attgatagtc 240
a 241

<210> 399
<211> 241
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 399
cagagtgaga tgggagtggg agggccaatc tgatacagaa ggggggtgaag ggtagggccc 60
ctgagcagcc cacccttac cctgacgaag gcaatcctcc tctggaatgt ctcttccttc 120
ttcagtctgg gttctgcctc agccacgaac tgggaaggag tgaggaaat cccaacggca 180
atgagagtat ccagtgact ccaaacagga angaatcagt gttcanaaag tcagggccct 240
t 241

<210> 400
<211> 241
<212> DNA
<213> Homo sapiens

<400> 400
ggtactcttg ctcttttagc tagagtgtat gtgaaaataa agaaatacat cattgtattc 60
acaaccatgt gtcttcattt ataacttttt gtttaaaaaa tttttagttc aagtttagtt 120

118

cattgatatt atcctctgaa tgcagttaag gctgggcaga aattctactc atgtgacatc 180
tgccacaggt ctatcttgaa gcttttcttc taatgggcaa tgtttgtcct taccaggatt 240
t 241

<210> 401

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 401

nncaggtact ttgtagagca gagagaggct ttggttcctc ctttcttcaa tcacgtggag 60
atgtgtcatc acctgggatt tcctctgggc cgccttttct gggccaacag ccaacacatg 120
ctggtaataga cggatggtat gtaagcgatc tttgttctca gcacggacat aacgccgtaa 180
ggcctggaga atgcgatgag gccgtggcgg gtcagactgc aaggcagcca ggtagttctc 240
c 241

<210> 402

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 402

ggcaggtcca aaaaaaacct aaaaaanngtt tcaggaatgt agagaaatat ccaacttaaa 60
tagcgaaaaa gtgcaccata attactgctg cactgcagtc atttctgcaa ttcccatggt 120
tcttaataaa ctatcttgct agataacaca caatataaag agcaattatg aaaaacagac 180
atttacatat acctctaaag tcttattggg aatatcctgt ttggccattg ggataaccaa 240
t 241

<210> 403

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 403

agggtgtaac taccgcctcc gagacgggat tgatgacgag tcctatgang ccattttcaa 60
gccggtcatt tccaaagtaa tggagatggt ccagcctagt gcggcggctc tacagtgtgg 120
ctcagactcc ctatctgggg atcgggttagg ttgcttcaat ctaactatca aaggacacgc 180
caagtgtgtg gaatttgtca agagctttta cctgcctatg ctgatgctgg gaggcgggtg 240
t 241

119

<210> 404
<211> 241
<212> DNA
<213> Homo sapiens

<400> 404
cagggtactgc aaccataaa atactgtttc ctcataattc accttcctta atttgagatt 60
ttctgtcttc ttttcacggc attcaaagta ggaataaact ttgcttgtgt tgggtggata 120
ttgtttatag tgagtaacct tgtaggagtc ggtggccagg aggatgttga actcggcttc 180
tgccgcagga ttcattctcg gccggaggac aaggggcccg cgcgcgcga gtcacctgac 240
c 241

<210> 405
<211> 266
<212> DNA
<213> Homo sapiens

<400> 405
ttctgggctg gggagtggag agaaagaagt tgcagggctt acaggaaatc ccagagcctg 60
aggttttctc ccagatttga gaactctaga ttctgcatca ttatctttga gtctatattc 120
tcttgggctg taagaagatg aggaatgtaa taggtctgcc ccaagccttt catgccttct 180
gtaccaagct tgtttccttg tgcattcctc ccaggctctg gctgcccctt attggagaat 240
gtgatttcca agacaatcaa tccaca 266

<210> 406
<211> 231
<212> DNA
<213> Homo sapiens

<400> 406
ttggtgaaga accattcctc ggcattcctg cggttcttct ctgccatctt ctcatactgg 60
tcacgcatct cggtcagaat gcggctcagg tccacgccag gtgcagcgtc catctccaca 120
ttgacatctc caccacctg gcctctcagg gcattcatct cctcctcgtg gttcttcttc 180
aggtaggcca gtcctcctt caggctctca atctgcatct ccaggtcagc t 231

<210> 407
<211> 266
<212> DNA
<213> Homo sapiens

<400> 407
cagcatcatt gtttataatc agaaactctg gtccttctgt ctggtggcac ttagagtctt 60
ttgtgccata atgcagcagt atggagggag gattttatgg agaaatgggg atagtcttca 120
tgaccacaaa taaataaagg aaaactaagc tgcattgttg gttttgaaaa ggtattata 180
cttcttaaca attctttttt tcagggactt ttctagctgt atgactgtta cttgaccttc 240
tttgaaaagc attcccaaaa tgctct 266

<210> 408
<211> 261
<212> DNA
<213> Homo sapiens

<400> 408
ctgtgtcagc gagcctcggg aactgattt ccgatcaaaa gaatcatcat ctttaccttg 60
acttttcagg gaattactga actttcttct cagaagatag ggcacagcca ttgccttggc 120

120

ctcacttgaa gggctctgcat ttgggtcctc tggctctcttg ccaagtttcc cagccactcg 180
agggagtaat atctggaggg caaagaagag acttatgtta ttgttgaacc tccagccaca 240
gggaggagca tgggcatggg t 261

<210> 409

<211> 266

<212> DNA

<213> Homo sapiens

<400> 409

gctgacagta atacactgcc acatcttcag cctgcaggct gctgatgggtg agagtgaat 60
ctgtcccaga cccgctgcca ctgaatcggc cagggatccc ggattcccgg gtagatgccc 120
agtaaagtga cagtttagga ggctgtcctg gtttctgctg gtaccaagct aagtagttct 180
tattgttgga gctgtctaaa acactctggc tggctcttga gttgatgggtg gccctctcgc 240
ccagagacac agccaggag tgtgga 266

<210> 410

<211> 181

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 410

caaaaggtn c ttttgn tca aaancnattt ttattccttg atatttttct tttttttttt 60
tttgnngatg gggacctgtg aatttttcta aaggggnnnn ttnannnnngg aagaaaaccn 120
ngntccggtt ccagccaaac cngtngctna ctttccacct tntttccacc tccctcnggt 180
t 181

<210> 411

<211> 261

<212> DNA

<213> Homo sapiens

<400> 411

gcccctgcag tacttgggccg atgtggacac ctctgatgag gaaagcatcc gggctcacgt 60
gatggcctcc caccattcca agcggagagg ccgggcgtct tctgagagtc agggctcagg 120
tgctggagtg cgcacggagg ccgatgtaga ggaggaggcc ctgaggagga agctggagga 180
gctggccagc aacgtcagtg accaggagac ctctgccgag gaggaggaag ccaaggacga 240
aaaggcagag cccaacaggg a 261

<210> 412

<211> 171

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 412

121

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nttttntctt tacaattcag tcttcaacaa cttgagagct ttcttcatgt tgncaagcaa 60
cagagctgta tctgcaggnt cgtaagcata nagacngttt gaatatcttc cagngatatc 120
ggctctaact gncagagatg ggtcaacaaa cataatcctg gggacatact g 171
```

<210> 413

<211> 266

<212> DNA

<213> Homo sapiens

<400> 413

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ttaggaccaa agatagcatc aactgtatct gaaggaactg tagtttgccg attttatgac 60
atTTTTtataa agtactgtaa ttctttcatt gaggggctat gtgatggaga cagactaact 120
cattttgttta ttTgcattaa aattattttg ggtctctgtt caaatgagtt tggagaatgc 180
ttgacttggtt ggtctgtgta aatgtgtata tataataacc tgaatacagg aacatcggag 240
acctattcac tcccacacac tctgct 266
```

<210> 414

<211> 266

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 414

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tttgccataa ttgagtgaag agtggcagat ggcattaaact ctgctccgct tcaagctggc 60
tccatgacca ctcaaggcct cccancctg ttctgtcaagt tgcctcgaag tccaagcaat 120
ggaatccatg tgTttgcaaa aaaagtgtgc tanttttaag gntcttcgta taagaatnaa 180
tganacaatt ttctaccaa aggangaaca aaaggataaa tataatacaa aatatatgta 240
tatgggtggt tgacaaatta tataac 266
```

<210> 415

<211> 266

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 415

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cctccatcca gtctattaat tgttgccggg aagctanagt aagtagttcg ccagtttaata 60
gtttgcgcaa cgTtgTtgcc attgctacag gcatcgtggt gtnacgctcg tcgattggta 120
tggcttcatt cagctccggt tcccaacgat caaggcgagt tacatgatcc cccatgttgt 180
gcaaaaaagc ggTtagctcc ttcggtcttc cgatcgttgt canaagtaag ttggccgcag 240
tgTtatcact catggTtatg gcagca 266
```

<210> 416

<211> 878

<212> DNA

<213> Homo sapiens

<400> 416

```

cctgacgata gccatggctg taccacttaa ctatgattct attccaactg ttcagaatca 60
tatcacaaaa tgacttgtag acagtagttt acaacgactc ccaagagagg aaaaaaaaaa 120
aaaaagacgc ctcaaaattc actcaacttt tgagacagca atggcaatag gcagcagaga 180
agctatgctg caactgaggg cacatatcat tgaagatgtc acaggagttt aagagacagg 240
ctggaaaaaa tctcatacta agcaaacagt agtatctcat accaagcaaa accaagtagt 300
atctgtctcag cctgccgcta acagatctca caatcaccaa ctgtgcttta ggactgtcac 360
caaagtcaga ttccggtgcta accagggtggc atctatgata aacgtcgccc ctcttattta 420
acaaagggct ctgaaggagg tgttctccaa gcaacaagga gactgcttca gtacaagact 480
ttgcaccttg aattcaattg catcaagtgt ggatagcaaa ataagtatct taccattgaa 540
atatgtgttc agcctaagat tttaccacc agcagaacaa aagtgagggg gagaggggatg 600
ggccagttag gggatggggg agaaaaaaaa atcacaggat taccacaaaa gccttgtttt 660
aaaagggctc ccttcactat tcaggaaggg aagtgggaagg agaaattaac caattcctgc 720
cacagcagcc ctttttggct gcttcacaaa tagatacttt atggagtggtc acagccaacc 780
ctatctgtga cctgccctgc ggataaacac agccaagcag gtttaattag atcaaagaca 840
caaagggcta ttccctcctt tcataacaac gcagacct 878

```

<210> 417

<211> 514

<212> DNA

<213> Homo sapiens

<400> 417

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ttctgacttc tagaagacta aggtcggctt gtgtttgctt gtttgccac ctttggttga 60
taccacagaga acctggycac ttgctgcctg atgcccaccc ctgccagtca ttctctcatt 120
cacccagcgg gaggtgggat gtgagacagc ccacatttga aaatccagaa aaccgggaac 180
agggatttgc ccttcacaat tctactcccc agatcctctc ccctggacac aggagaccca 240
cagggcagga ccctaagatc tggggaaagg aggtcctgag aaccttgagg tacccttaga 300
tcctttttcta cccactttcc tatggaggat tccaagtcac cacttctctc accggcttct 360
accagggctc aggactaagg cgttttctcc atagcctcaa cattttggga atcttccctt 420
aatcaccctt gctcctcctg ggtgcctgga agatggactg gcagagacct ctttggttgcg 480
ttttgtgctt tgatgccagg aatgccgcct agtt 514

```

<210> 418

<211> 352

<212> DNA

<213> Homo sapiens

<400> 418

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ctgcaccagc gattaccagt ggcattcaaa tactgtgtga ctaaggattt tgtatgctcc 60
ccagtagaac cagaatcaga caggtatgag ctagtcaaca gcaagtcttt gttggattcg 120
agtaggctca ggatctgctg aaggctcggag gagttagtcc ccgcaatcaa gagcctgtct 180
tcctgaagcc cttggtgata ttttgccact cagccaagaa tgaggatgca tccttcagat 240
tctctatgtc ccgaacctgg aacccatcca cgccagcttg cagccaaaaa tccagagcat 300
ccttcacctt ggtggaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aa 352

```

<210> 419

<211> 344

<212> DNA

<213> Homo sapiens

<400> 419

```

ctggacacca taatcccttt taagtggctg gatggtcaca cctctcccat tgacaagctg 60
ggttaagtca ataggttgac taggatcaac acgaccctaa tcaataagat actgcagtct 120
attgagactc aaaggcttat actggcgctc gaaactatgt ccttcgttaa acccgatttt 180

```

```

tgggattcgg atgtaaaatg gagtctggcc tccctcaaag cccaagcggg gccgggttcc 240
tctttgcctt tctcctttat ggctctgcc acattttcta cctcttctcc gacctcttgg 300
tcttctctcc ggtttcttgg agccgggatt cggctttaag ttgg 344

```

<210> 420

<211> 935

<212> DNA

<213> Homo sapiens

<400> 420

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cgaaagtcaa cgtaagggg ctcaggtgaa ccatgatgat gaccttctgt tgactttgaa 60
atattggctc ttgtgggtga caaaagccag acaagctgtg gctgtgggtcc gattttaaga 120
cgaggttctc aaagatccaa aggagggaaa gggatttga aacactgtgt atcatctgag 180
acacacgtgt cctcatgata ttaaattgcct actttaaaag cacctaatac tgcccttcat 240
tgtggtcaga agagatttct acaaaagcac tcagaattct ggaggcagtt gtgattttgc 300
catgtggcag ttggtttgtg gagttgggca ggtgtgaaag ggtaaaactc cacttctgaa 360
tgctgcttct gccccctggg acccagcaca ttgttagacc atcttcttga ctgaaaattc 420
tctcctgatg ctgagccctg caccaccacc ttcttcttcc taactatgaa ttgatggcaa 480
agtccactca aaacaaccag ttaagtgtc acgagagagt agtcaagcac ctccagaaag 540
aaaccgggtt tttgttcaca tagcaggaag tgactccctg ggtggtaatt tatcttggaa 600
acacaggtag attggcagaa aaacgggaac atgtaggtag cgcgatgttg gtgcatgtcc 660
attactttgg gataggcttt ctcatgtctt cctcaaata tagttgagcc agttttccag 720
tggcaattct gagtgacttg cgcttgtctt atggtgtggt caagggacgt tcagaactac 780
ggaaaacttt tactgaaaca gcgaagcaga gtataccggc atgagaggga agatgaacac 840
tcacctatgt accactcttt gacaataaat atagtatttc tcaaaaaaaaa aaaaaaaaaa 900
agtaaaaaaa ctgaaatcgc aagtcaaaaa atcca 935

```

<210> 421

<211> 745

<212> DNA

<213> Homo sapiens

<400> 421

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ggcttctgagc ggccgcccgg gcaggtccta gatgtcattt gggacccttc acaaccattt 60
tgaagccctg tttgagtcct tgggatatgt gagctgtttc tatgcataat ggatattcgg 120
ggttaacaac agtcccctgc ttggcttcta ttctgaatcc ttttctttca ccatggggtg 180
cctgaagggt ggctgatgca tatggtacaa tggcaccag tgtaaagcag ctacaattag 240
gagtggatgt gttctgtagc atcctattta aataagccta ttttatcctt tggcccgctc 300
actctgttat ctgctgcttg tactggtgcc tgtacttttc tgactctcat tgaccatatt 360
ccacgaccat ggttgatcat cattacttga tcctacttta catgtctagt ctgtgtggtt 420
ggtggtgaat aggtctcttt ttacatggtg ctgccagccc agctaattaa tgggtgcacgt 480
ggacttttag caagcgggct cactggaaga gactgaacct ggcattggaat tcctgaagat 540
gtttggggtt ttttcttttc ttaatcgaaa gttaacattg tctgaaaagt tttgttagaa 600
ctactgcgga acctcaaaat cagtagattt ggaagtgat caaagctaaa ctttttccct 660
ggccctcctt gtgttctaata tgcttgcaag tgtaatacta ggatgtccaa gatgccagtt 720
tttgcttctt tgtagttgt cagac 745

```

<210> 422

<211> 764

<212> DNA

<213> Homo sapiens

<400> 422

```

gagttcagta gcaaagtcac acctgtccaa ttccttgagc tttgctcact cagctaattg 60
gatggcaaaag gtggtggtgc tttcatcttc aggcagaagc ctctgcccat cccctcaag 120

```

```

ggctgcaggc ccagttctca tgctgccctt ggggtgggcat ctgttaacag aggagaacgt 180
ctgggtggcg gcagcagctt tgctctgagt gcctacaaaag ctaatgcttg gtgctagaaa 240
catcatcatt attaaacttc agaaaagcag cagccatgtt cagtcaggct catgctgcct 300
cactgcttaa gtgcctgcag gagccgcctg ccaagctccc ctccctacac ctggcacact 360
ggggctctgca caaggctttg tcaaccaaag acagcttccc ctttttgatt gcctgtagac 420
tttgagacca agaaacactc tgtgtgactc tacacacact tcagggtggtt tgtgcttcaa 480
agtcattgat gcaacttgaa aggaaacagt ttaatggtgg aaatgaacta ccatttataa 540
cttctgtttt tttattgaga aaatgattca cgaattccaa atcagattgc caggaagaaa 600
taggacgtga cgggtactggg ccctgtgatt ctcccagccc ttgcagtccg ctagggtgaga 660
ggaaaagctc tttacttccg cccctggcag ggacttctgg gttatgggag aaaccagaga 720
tgggaatgag gaaaatatga actacagcag aagcccctgg gcag 764

```

<210> 423

<211> 1041

<212> DNA

<213> Homo sapiens

<400> 423

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ctcagagagg ttgaaagatt tgcttacgaa agggacagtg atgaagctaa gctctagatc 60
caggatgtct gacttcaaatt tgaaactccc aaagtaatga gtttggaagg gtgggggtgtg 120
gcctttccag gatgggggtc ttttctgctc ccagcggata gtgaaacccc tgtctgcacc 180
tggttgggcy tggtgcttcc ccaaagggtt tttttttagg tccgtcgctg tcttgtggat 240
taggcattat tatctttact ttgtctccaa ataacctgga gaatggagag agtagtgacc 300
agctcagggc cacagtgcga tgaggaccat ctctcacct ctctaaatgc aggaagaaac 360
gcagagtaac gtggaagtgg tccacaccta ccgccagcac atgtggaatg acatgaacct 420
cggcaacctg cacctgttca tcaatgccta caacaggat tgggatgtag ttcagccaca 480
tcattgctat ttatgagggtg tcttctgtag atccgaaatg tgggacagat gagagggaga 540
gtataaaatg agcgggaagag gcaggctctg agtttgagca aatagattaa taggacaggt 600
gtccccagga aggacacctg gcctgtaagc tggttcctgg cattcagctc gccttgagg 660
gatctgaaca aacactccag accactgggg gtgcagacgt gagagggacg cagtcgcaca 720
ctcagagggg tgagagttaa tatgtgtgcc cgctgctgac ctccacgaaa ggccaaatgt 780
aagaagagct aagttagaga gcagcaaagc actcctggag gccggggata atccaggcag 840
gcttctggga gtttgcatt ccaaggataa ggaggacctg aacatggcct ttgcctaagg 900
cgtggccctc tcaaccagca ctagggtctt atctggagct cagctagggg aggagacagc 960
tcagggccat tgggtgtcagc cagagactct gtaatcttcc agggagctcg ctcaacctgc 1020
tgagctcgct ctgccacgca c 1041

```

<210> 424

<211> 1288

<212> DNA

<213> Homo sapiens

<400> 424

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ctaagaactg agacttgtga cacaaggcca acgacctaa attagcccag gggtgtagct 60
ggaagacctt caacccaagg atggaaggcc cctgtcacia agcctacctt gatggataga 120
ggacccaagc gaaaaaggta tctcaagact aacggccgga atctggaggc ccattgacca 180
gaacccagga aggatagaag cttgaagacc tggggaaatc ccaagatgag aaccttaaac 240
cctacctctt ttctattgtt tacacttctt actcttagat atttccagtt ctctgtttta 300
tctttaagcc tgattctttt gagatgtact ttttgatgtt gccggttacc tttagattga 360
cagtattatg cctgggccag tcttgagcca gctttaaatc acagctttta cctatttgtt 420
aggctatagt gttttgtaaa cttctgtttc tattcacatc ttctccactt gagagagaca 480
ccaaaatcca gtcagtatct aatctggctt ttgttaactt ccctcaggag cagacattca 540
tataggtgat actgtatttc agtcccttct tttgacccca gaagccctag actgagaaga 600
taaaatgggtc aggttgttgg ggaaaaaaa gtgccaggct ctctagagaa aaatgtgaag 660
agatgctcca ggccaatgag aagaattaga caagaaatac acagatgtgc cagacttctg 720

```


125

```

agaagcacct gccagcaaca gtttccttct ttgagcttag tccatccctc atgaaaaatg 780
actgaccact gctgggcagc aggagggatg atgaccaact aattcccaaa cccagtcctc 840
attggtacca gccttgggga accacctaca cttgagccac aattggtttt gaagtgcatt 900
tacaagtffc tggcatcact accactactg attaaacaag aataagagaa ctttttatca 960
tcatctgctt tattcacata aatgaagtgt tgatgaataa atctgctttt atgcagacac 1020
aaggaattaa gtggcttcgt cattgtcctt ctacctcaaa gataatttat tccaaaagct 1080
aagataaatg gaagactcct gaacttgtga actgatgtga aatgcagaat ctcttttgag 1140
tctttgctgt ttggaagatt gaaaaatatt gttcagcatg ggtgaccacc agaaagtaat 1200
cttaagccat ctagatgtca caattgaaac aaactgggga gttggttgct attgtaaaat 1260
aaaatatact gttttgaaaa aaaaaaac

```

<210> 425

<211> 446

<212> DNA

<213> Homo sapiens

<400> 425

```

ccacttaaac ggtgcctctg ccaactgggt gaatcatcgc cacttccagc accacgcca 60
gcctaacatc ttccacaagg atcccgatgt gaacatgctg cacgtgtttg ttctgggcga 120
atggcagccc atcgagtacg gcaagaagaa gctgaaatac ctgccctaca atcaccagca 180
cgaatacttc ttcttgattg ggccgccgct gctcatcccc atgtatttcc agtaccagat 240
catcatgacc atgatcgtcc ataagaactg ggtggacctg gcctgggccc tcagctacta 300
catccggttc ttcatcacct acatcccttt ctacggcatc ctgggagccc tcttttccct 360
caacttcate aggttcctgg agagccactg gtttgtgtgg gtcacacaga tgaatcacat 420
cgatcatggag attgaccagg aggacc

```

<210> 426

<211> 874

<212> DNA

<213> Homo sapiens

<400> 426

```

tttttttttt tttttttttt ttttttcaat taaagatttg atttattcaa gtatgtgaaa 60
acattctaca atggaaactt ttattaaatg ctgcatgtac tgtgctatgg accacgcaca 120
tacagccatg ctgtttcaga agacttgaaa tgccattgat agtttaaaaa ctctacaccc 180
gatggagaat cgaggaagac aatttaatgt ttcatctgaa tccagagggt catcaaatta 240
aatgacagct ccacttggca aataatagct gttacttgat ggtatccaag aagaaatgg 300
tggtgatgga taaattcaga aatgcttccc caaagggtggg tggtttttaa aaagttttca 360
ggtcacaaac cttgcagaaa aactgatgc ccaacacact gattcgcggg ccaggaaaca 420
cgggtcttcc aagttccaag gggctggggg tccccaacga tcaagttcct gtgctgtaat 480
caagaggggt ctttggactg gatagggagc acttgggagc tgtacaccat cagtataat 540
ggatggcagt gtaaaagatg atccaaatga cctgagatgc tcctgaggag tgggtcacca 600
gaccacaggag tgccactgta gggctgcttc tttgctttag tcatcacaca cacacacagc 660
tccagagcag caatggcctt tcctgtaaca ggaaaaaagc ctctgctat tcccaagaac 720
cctcgtaatg gcaaaactcc ccaaatgaca cccaggacca cagcaatgat ctgtcggaac 780
cagttagatca catctaaaaa ttcatcctta tcctccagg ccgcgtcgct ccgcagcacc 840
ttactccaga cggagacttt gagggccccg ttgg

```

<210> 427

<211> 638

<212> DNA

<213> Homo sapiens

<400> 427

```
acttgtaatt agcacttggg gaaagctgga aggaagataa ataacactaa actatgctat 60
ttgatttttc ttcttgaaag agtaaggttt acctgttaca ttttcaagtt aattcatgta 120
aaaaatgata gtgattttga tgaattttat ctcttgtttg aatctgtcat tcaaaggcca 180
ataatttaag ttgctatcag ctgatattag tagctttgca accctgatag agtaataaaa 240
ttttatgggc ggggtgccaaa tactgctgtg aatctatttg tatagtatcc atgaatgaat 300
ttatggaaat agatatttgt gcagctcaat ttatgcagag attaaatgac atcataatac 360
tggatgaaaa cttgcataga attctgatta aatagtgggt ctgtttcaca tgtgcagttt 420
gaagtattta aataaccact cttttcacag tttattttct tctcaagcgt tttcaagatc 480
tagcatgtgg attttaaaag atttgccctc attaacaaga ataacattta aaggagattg 540
tttcaaaaata tttttgcaaa ttgagataag gacagaaaaga ttgagaaaaca ttgtatattt 600
tgcaaaaaaca agatgtttgt agctgtttca gagagagt 638
```

<210> 428

<211> 535

<212> DNA

<213> Homo sapiens

<400> 428

```
acaagatgat tcttctctct caatttgaca gatcaaagaa gtatcccttg ctaattcaag 60
tgtatggtgg tccctgcagt cagagtgtaa ggtctgtatt tgctgttaat tggatatctt 120
atcttgcaag taaggaaggg atggctattg ccttgggtgga tggctgagga acagctttcc 180
aagggtgacaa actcctctat gcagtgtatc gaaagctggg tgtttatgaa gttgaagacc 240
agattacagc tgtcagaaaa ttcatagaaa tgggtttcat tgatgaaaaa agaatagccca 300
tatggggctg gtccctatgga ggatacgttt catcactggc ccttgcattc ggaactgggc 360
ttttcaaatg tggatatagca gtggctccag tctccagctg gyaatattac gctgtctgtc 420
acacagagag attcatgggt ctccaacaa aggatgataa tcttgagcac tataagaatt 480
caactgtgat ggcaagagca gaatatttca gaaatgtaga ctatcttctc atcca 535
```

<210> 429

<211> 675

<212> DNA

<213> Homo sapiens

<400> 429

```
actattttca accctgagca ttaacactgc ataccaaggg ggggtgggtc aagaagctgg 60
ttagatcgaa gcacaagcac aagccactga tattctctat gtgatcaggt ttttcaaaa 120
aaatacatag ttttcaataa ataattgctta attttacaac tttgatacag caatgtcata 180
caccgtttca acacactaca ctctgcatgc tagatagtct acgagaagac gaaactttgc 240
catgcatttt ctttcccccc tagtgctatc aaacacttca tcctccagcg cactgcctca 300
ggtagcttta ctttctctct gtttcacagc aataggccgt gcgctggcat gcaaactcta 360
aaaaaggtcc cccccacaaa ccactcagac ttctacacaa aagggttttt cagcttttct 420
gtcctccaaac ctggagtggc taagaaagta agtttcatgt ggcttggaa aatacacact 480
tgtaaacagt gtcagtctga aaactgctct aaaacatcag gtggttctgt cctggtggcc 540
gtcacgaagc attatgggat gccataacca ctaggagtcc caaacggaa aaaataggcc 600
tccgttttaa aacagtcaat tcaaaaaagg tgtcacagaa caaatgcaa agactcttaa 660
accacaaca tatgt 675
```

<210> 430

<211> 434

<212> DNA

<213> Homo sapiens

<400> 430

```
acctctgcca gaagtccagc gagaggacct cacagtagag cacaggccac tccgggagtg 60
catcagaaga ttcattctca tggaggaaga aggcttcaaa cgtgaatggg taggagaagt 120
```

```

gagccacctt gtccattgcc agggacttgg tggcagcagg ctgtgttact cctgagagct 180
gctggaatgc tgggcttgac cagtgcagcag ttggcaattc taaaaagaag tggacgtaga 240
gattgtcata ctcatagcct tgggctgaaa cgacctctcc atttaciaag agccggaggg 300
cacctgggac agtcattctca aagtcgggtgc ctacgaggct gctgagatac tccttgtgcc 360
ggccataaag atccttgaac actcgcgcgtt cccgctcctc ctccctccggc tgtgcgtggg 420
gggaaacatt gtcg                                     434

```

<210> 431

<211> 581

<212> DNA

<213> Homo sapiens

<400> 431

```

acacaagcct ccagcccgac ccagcggcct aatgaaactc tggcaaccta tcctgggagc 60
ggccacgagt atccagctcc aagcccaagt gaggcgggga gtcaacttcc ccatgattgc 120
caagtgcaca agaccagaag cagggacgat taggctagtt ctgcggcaag gtgaactgga 180
gacctgtct ctgccctcct tccttggcct gtcccacaga catcccggtg ttttaaccac 240
tgcttttgca aggacctgct ctgtccactc caaatcaaag gatacttgca tccttcttac 300
acagactccc atctctctgc tcatagtggc cccaggctgc ccgagaaaaa gaaacttggg 360
tcagtagaag gctcattagt gtgaaggagt gagaggccag gccttctctg gacataatgc 420
ttctatgctt gtttcctaaa cacttgggtc acacacaata cctgggcagg aagagagaac 480
caagcaccac tggatggctc tggagccagg ggacttctat gcacatacaa ccaacatcac 540
cccactctgc tcatctgtgc ctccaccctg aacagcagag t                                     581

```

<210> 432

<211> 532

<212> DNA

<213> Homo sapiens

<400> 432

```

actccaactc aagtttacia gttacacctt tgccacagcc ttggctaaat cttgaactag 60
tgcagaattc agctgtggta gagtgcgtat cttagcatgc tccgatgtgg catacttggt 120
cttgacagtc atgtgctttg taagtccctg atttaccatg actacattct tagccagggtg 180
ctgcataact ggaagaagag attcttcagt atatgacagg taatgttgta gatttgggtg 240
ccattcacca ttatccagaa ttttcagtgc taagcaaaaa gtcctgtctg caatttgaga 300
aggaggaaaag tgcacatgt catagtccaa catagttagt tccatcagggt atttggccaa 360
agtatgttgc tgcacatcaa cctctccaat cttagatgct ctccgaagga agtgcaaaag 420
tagaggccga cccagaccaa agtttaaaag tcttagaatc ttcatttcca tctgtctgat 480
ttggtgctta gtataagtgt tgtcagtcac aaaagcaaag tcaccaattt ct                                     532

```

<210> 433

<211> 531

<212> DNA

<213> Homo sapiens

<400> 433

```

acttgggttt acagctcctt tgaaaactct gtgtttggaa tatctctaaa aacatagaaa 60
acactacagt ggttttagaaa ttactaattt tacttctaag tcattcataa accttgtcta 120
tgaaatgact tcttaaatat ttagttgata gactgctaca ggtaataggg accttagcaag 180
ctcttttata tgctaaagga gcatctatca gattaagtta gaacatttgc tgtcagccac 240
atattgagat gacactaggc gcaatagcag ggatagattt tgttgggtgag tagtctcatg 300
ccttgagatc tgtggtggtc ttcaaaatgg tggccagcca gatcaaggat gtagtatctc 360
atagttccca ggtgatattt ttcttattag aaaaatatta taactcattt gttgtttgac 420
acttatagat tgaaatttcc taatttatcc taaattttaa gtggttcttt ggttccagtg 480
ctttatgttg ttgtgtgttt tggatgggtg tacatattat atgttctaga a                                     531

```

<210> 434
<211> 530
<212> DNA
<213> Homo sapiens

<400> 434
acaagagaaa acccctaata aaaggatggc tttagatgac aagctctacc agagagactt 60
agaagttgca ctagctttat cagtgaagga acttccaaca gtcaccacta atgtgcagaa 120
ctctcaagat aaaagcattg aaaaacatgg cagtagtaaa atagaaacaa tgaataagtc 180
tcctcatatc tctaattgca gtgtagccag tgattattta gatttgata agattactgt 240
ggaagatgat gttggtggtg ttcaagggaa aagaaaagca gcactctaaag ctgcagcaca 300
gcagaggaag attcttctgg aaggcagtga tgggtgatag gctaagtaca ctgaaccaga 360
ctttgcacct ggtgaagatt ctgaggatga ttctgatttt tgtgagagtg aggataatga 420
cgaagacttc tctatgagaa aaagtaaagt taaagaaatt aaaaagaaag aagtgaaggt 480
aaaatcccca gtagaaaaga aagagaagaa atctaaatcc aaatgtaatg 530

<210> 435
<211> 677
<212> DNA
<213> Homo sapiens

<400> 435
accttatgat ctaattaata gatattagaa acagtagaaa gacaagttac acgtcaatgc 60
ccaatgacta gagtcaacat taaagagttg taatttaagt aatccaaact gacatctaata 120
tccaaaatca ttataaaat gtatttggct ttggaatcca caggacttca aacaagcaaa 180
gtttcactgc agatagtcac aaagatgcag atacactgaa atacttaaga gccttattaa 240
tgatttttgt tattttggat cttctgtttt ttctttatta tgggtccgaag cctccttaat 300
accaatttat cagacagaag catgtcatct tgttgttcaa gataatccag taaattttca 360
gtccattcaa gtgccgcttt atggctaata cgcttctctg gattcagttc tgtttttcta 420
ctcttactgg aaggcttttg ctccagcagcc ttggtctggt cctcagcact ttactgtca 480
gtcagcacct gacagcttga gtcactgttc cgagagtcga accactgatc aatattctca 540
atgtcaacat gttcacattc ttctgtgttc tgtaaaactg ttgctaaatt agctgctaaa 600
atggctcctt catcaatgtt catacctgaa ttctcttcat tggcagggaa aagttttttc 660
catgctttgg ttatggg 677

<210> 436
<211> 573
<212> DNA
<213> Homo sapiens

<400> 436
acctcttagg gtgggagaaa tggatgaagag ttgttcctac aacttgctaa cctagtggac 60
agggtagtag attagcatca tccggataga tgtgaagagg acggctgttt ggataataat 120
taaggataaaa atttggccag ttgacagatt ctgtttccag cagtttttac agcaacagtg 180
gagtgttca gtattgtgtt cctgtaaatt taattttgat ccgcaatcat ttgtatata 240
atgctgtttg aagttttgtc ctattggaaa agtcttgtgt tgcaggggtg cagttaagat 300
ctttgtgatg aggaatggga tgggctaatt ttttgccgtt ttcttggaa tgggggcatg 360
gcaaatacag taggtagtt tagttcttta cacagaacat gataaactac acctgttgat 420
gtcaccgtct gtcaatgaat attatagaag gtatgaagg gtaattacca taataacaaa 480
acacctgtc tttagggctg acctttcgtc ctttgacctc ctcagcctcc attcccatct 540
tcgctcagac tgcaagtatg tttgtattaa tgt 573

<210> 437
<211> 645

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(645)

<223> n = A,T,C or G

<400> 437

```
acaattggta tccatatctt gttgaaattg taatgggaaa acaatatatt tcaatctcta 60
tgtagatagt gggtttttgt ttccataata tattctttta gtttactgta tgagttttgc 120
aggactgcat aatagatcac cacaatcata acatcttagg accacagaca tttatgagat 180
catggcttct gtgggttaga agtatgctca tgtcttaact gggtcctctg ctcaagtctta 240
tctggctgca atcaagggtgt cagctgggct gaattttcat ttggaatctt gactgggaaa 300
gagtctgctt ccaagggtcat gaagtttgct ggcaaaatgt atgtttttat gacagtatga 360
ctgaaatccc aagctatctc ctgactttta gctgggtaat ctcaaggccct aaatggtgcc 420
tacagttcct agaggctggt cacagttcct agccatgtgg atttccctcaa catggctgct 480
tgcttcatca agtcagcaag aatagcctgt catatcagtg tatatcaggc tcaactcagga 540
taatttccct actgatgagc caaacactaa ctgatttttag agcttaacta catctgcaaa 600
attcngttca ccagaggcaa gtcatatcca gggaaggaga agtgt 645
```

<210> 438

<211> 485

<212> DNA

<213> Homo sapiens

<400> 438

```
acagaattga gagacaagat tgcttgtaat ggagatgctt cttagctctca gataatacat 60
atctctgatg aaaatgaagg aaaagaaatg tgtgttctgc gaatgactcg agctagacgt 120
tcccaggtag aacagcagca gctcatcact gttgaaaagg ctttggcaat tctttctcag 180
cctacaccct cacttggtgt ggatcatgag cgattaaaaa atcttttgaa gactgttggt 240
aaaaaaagtc aaaactacaa catatttcag ttggaaaatt tgtatgcagt aatcagccaa 300
tgtatttatc ggcategcaa ggaccatgat aaaacatcac ttattcagaa aatggagcaa 360
gaggtagaaa acttcagttg ttccagatga tgatgtcatg gtatcgagta ttctttatat 420
tcagttccta ttttaagtcatt ttttgtcatg tccgcctaata tgatgtagta tgaaaccctg 480
catct 485
```

<210> 439

<211> 533

<212> DNA

<213> Homo sapiens

<400> 439

```
acagcagttt cctcatccct gcagctgtgt ttgaacaggt catttaccat actgtcctcc 60
aggttcaaca gtatggctcc aaatgatgaa atttcattct gattttctgg ctgaagacta 120
ttctgtttgt gtatgtccac cacagttact ttatcccttc atctgtggat gggcagaatg 180
aaacatatat ggaaatgttc tgtgcaataa aaacagcagt ggtaacacag atgtaggctc 240
tgagtgtctc actggagact gaagtcacac gatatgcaac aaagcctttg tctccctgat 300
gtttttgcct cctgctgggc atgtgctttc acacatcaag agaggacatt taacatttga 360
gccacagtgt catttgctgt tgtctgatgg ttggttggca gagaatttga actggagatg 420
aactttatta tccaggacgc tgagagtata acatgcatac cagagctttt agagcactgt 480
gatgtaacat gtcaagcaga aatagggagc atgtttacag ccattctatg aaa 533
```

<210> 440

<211> 341

<212> DNA

<213> Homo sapiens

<400> 440

```
catggggtag gggggtcggg gattcattga attgtggttg gcaggagcaa gccctgctca 60
cactctcaca ctgcaccca gaattgtcaa agatacagat tgtaaaaatc tacgatccct 120
cagtctcact cacaaaaaat aaaatctcat gtccccaacg aaccagagt cagacgacag 180
ctggagcatt ggaggggaca gtcagaaagg agacaagtga aaacggtcag atggacacag 240
gcggaggaga aaagacagag ggagagagac catcggaac aatcagaggg gccgagacga 300
tcagaaaagg gtcagcccga gacaggctga gccagagttt c 341
```

<210> 441

<211> 572

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(572)

<223> n = A,T,C or G

<400> 441

```
aagtttgagg ataatttatt atgcagcaag agataataca caggacttct canagcactt 60
aatatgttaa tataaatctc caaaaaaaaa gatatacaat gaaacattcc tcttagttat 120
ctggccaagg anactttntt tttttganaa tattcttcaa aaagctgac taatgaratg 180
gctctggtcc tacaattcca tgtaacttct aaccttgatt ttatctcatg agcaaatcat 240
ttatccttcc agaacctcaa cttttccctt ttacaaagta gaaataaacc atctgccttt 300
acataaatca ttaatacagc cctggatggg cagattctga gctatttttg gctggggggg 360
gggaaatagc ctgtggaggt cctaaaaaga tctacggggc tcgagatggg tctctgcaag 420
gtagcaggtg ggctcagggc ccatttcagt ctttgttccc caggccattt ccacaaaatg 480
gtgagaaata gtgtcttctt ttagcttgc cataactcaa agatgggggg catggacctg 540
ggcctttcta ggctagggca tgaacctcct cc 572
```

<210> 442

<211> 379

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(379)

<223> n = A,T,C or G

<400> 442

```
tcccagctgc actgcttaca cgtcttcctt cgtnttcacc taccgccagg ctgactcctt 60
ccccagntgt gcagctgcc accgcaaggg cagcagcagc aatgagcctt cctctgactc 120
gctcagctca cccacgctgc tggccctgtg agggggcagg gaaggggagg cagccggcac 180
ccacaagtgc cactgccga gctggtgcat tacagagagg agaaacacat cttccctaga 240
gggttctctg agacctaggg aggaccttat ctgtgcgtga aacacaccag gctgtgggcc 300
tcaaggactt gaaagcatcc atgtgtggac tcaagtcctt acctcttccg gagatgtagc 360
aaaacgcatg gagtgtga 379
```

<210> 443

<211> 511

<212> DNA

131

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(511)

<223> n = A,T,C or G

<400> 443

```

acatgcccc aaaggctcgc ttcattgcta cgatttctcta cttaaatcca cattcacagc 60
tattgcctca gacctctgg aggaggggcc aggggttagc tggctttgaa tagcatgtag 120
agcacaggca gtgtggccac aaatgtcaca caggtgacca gggtgctata gatgggtgtc 180
ctgttgactt gggcttctag tctctgctcc gtgtctgaca gtgccaagat catgctcccc 240
tgctccagca agaagctggg catagccccg tctgctggtt ccaccaggcc tgggtgtgct 300
gcagacttta caagctgaac cccccagcc atttggttac aagtcttttc taggccatca 360
agctgctctc gtaagccttc tagacatgaa tggacttgcc tggaatgact aagctgctct 420
ttcaaggcag ctgaaaggac atcnacatct ctgtctctgg tggggggact acctgcctgt 480
gacccagagt cctgcctcgg cccagcagca t                                     511

```

<210> 444

<211> 612

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(612)

<223> n = A,T,C or G

<400> 444

```

acaggaagaa ttctacagtt aatctatcac agtgttccag caaagcatat gttgaaaact 60
acagttttca atctaacatc taaattttaaa aaagtagcat ttcagcaaca aacaagctca 120
gagaggctca tggcaaaagt gaaataacag aactattgct cagatgtctg caaagtcaag 180
ctgctgccct cagctccgcc cacttgaagg cttaggcaga cacgtaagggt ggcggtggct 240
ccttggcagc accattcaca gtggcatcat catacggagg tagcagcacc gtagtgctat 300
tgctggtaac ataaaccagg acatcagagg agttcctacc attgatgtat cggtagcagt 360
tccaaacaca gctaatacaag taacccttaa agtcaagat aatgctaata aacagaagaa 420
taataaggac caaacaggta ggattcactg acatgacatc atctctgtag ggaaaattag 480
gaggcagttg ccgtatgtat tcctgaatgg agtttgata aataagcaca gtgattgcaa 540
ccaacanctt cagggcaaag tcaaagatct ggtaacagaa gaatgggatg atccaggctg 600
cgcgttgctt gt                                     612

```

<210> 445

<211> 708

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(708)

<223> n = A,T,C or G

<400> 445

```

accatcctgt tccaacagag ccattgccta ttcctaaatt gaatctgact ggggtgtgccc 60
ctcctcggaa cacaacagta gaccttaata gtggaaacat cgatgtgcct cccaacatga 120
caagctgggc cagctttcat aatgggtgtgg ctgctggcct gaagatagct cctgcctccc 180

```

132

```

agatcgactc agcttggatt gtttacaata agcccaagca tgctgagttg gccaatgagt 240
atgctggctt tctcatggct ctgggtttga atgggcacct taccaagctg gcgactctca 300
atatccatga ctacttgacc aagggccatg aaatgacaag cattggactg ctacttgggtg 360
tttctgctgc aaaactaggc accatggata tgtctattac tcggcttggt agcattcgca 420
ttcctgctct cttaccccca acgtccacag agttggatgt tcctcacaat gtccaagtgg 480
ctgcagtggg tggcattggc cttgtatata aaggacagc tcacagacat actgcagaag 540
tcctgttggc tgagatagga cggcctcctg gtcctgaaat ggaatactgc actgacagag 600
agtcatactc cttagctgct ggcttggccc tgggcatggt ctncctgggg catggcagca 660
atttgatagg tatgtntgat ctcaatgtgc ctgagcagct ctatcagt 708

```

<210> 446

<211> 612

<212> DNA

<213> Homo sapiens

<400> 446

```

acaagcaacg cgcagcctgg atcatcccat tcttctgtta ccagatcttt gactttgccc 60
tgaacatggt ggttgcaatc actgtgctta tttatccaaa ctccattcag gaatacatatc 120
ggcaactgcc tcctaatttt ccctacagag atgatgtcat gtcagtgaat cctacctgtt 180
tggtccttat tattcttctg tttattagca ttatcttgac ttttaagggt tacttgatta 240
gctgtgtttg gaactgctac cgatacatca atggtaggaa ctctctgat gtcctggttt 300
atgttaccag caatgacact acggtgctgc taccctcgta tgatgatgcc actgtgaatg 360
gtgctgccaa ggagccaccg ccaccttacg tgtctgccta agccttcaag tgggcggagc 420
tgagggcagc agcttgactt tgcagacatc tgagcaatag ttctgttat tcaacttttg 480
catgagcctc tctgagcttg tttgttgctg aaatgctact ttttaaaatt tagatgttag 540
attgaaaact gtatgttttca acatatgctt tgctggaaca ctgtgataga ttaactgtag 600
aattcttcct gt 612

```

<210> 447

<211> 642

<212> DNA

<213> Homo sapiens

<400> 447

```

actgaaagaa ttaaagtcag aagtcttccc aaaacaaaaa gaactgcccc cagagaaaat 60
cctttctgat acttttcatt gctaaaataa aacaggcggg aaatgtggaa aagaaattca 120
acaaaataat gtagcaccag aagaacaagt cctagatgat tcaagttcaa aaggtaagct 180
ccagcaatgt ggaagaggta aagaccaatg tagacaagct gacgaggaat atcttctttt 240
ttggttttct ggaagtagag ttcaggaaaa gcatgaagcc agtaagccag ctgtgatatg 300
tagaaaaact tcatttgaaa tgtcatcagg ttatggggat aagccctcca taagatagtt 360
gggtctgaga tgtagttttc agagatgaga atgaatgtgc cccaaacaca ggcaaaaagg 420
tagaacgcac taagctgacc agattcatta aacttgctgt gttttgtttt ggagaagtgc 480
attcgctgt taattttatc caacatatac tcttgaatta cggcatgaat aattatcgcc 540
actagcatgt agaagaaaac agtagccaaa tctttgatgc catagtaata aaggacact 600
gattcagtag cttgttcttc tgttgctggg agggtgacat tg 642

```

<210> 448

<211> 394

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1) ... (394)

<223> n = A,T,C or G

<400> 448

```
accagaagac cttagaaaaa ggaggaaaagg aggagaggca gataatttgg atgaattcct 60
caaagngttt gaaaatccag aggttcctag agaggaccag caacagcagc atcagcagcg 120
tgatgttatt gatgagccca ttattgaaga gccaagccgc ctccaggagt cagtgatgga 180
ggccagcaga acaaacatag atgagtcagc tatgcctcca ccaccacctc agggagttaa 240
gcgaaaagct ggacaaattg acccagagcc tgtgatgcct cctcagcagg tagagcagat 300
ggaaatacca cctgtagagc ttccccaga agaacctcca aatatctgtc agctaatacc 360
agagttagaa cttctgccag aaaaagagaa ggag                                     394
```

<210> 449

<211> 494

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(494)

<223> n = A,T,C or G

<400> 449

```
acaaaaaaca caaggaatac aaccaatag aaaatagtcc tgggaatgtg gtcagaagca 60
aaggcntgag tgtctttctc aaccgtgcaa aagccgtgtt cttcccggga aaccaggaaa 120
aggatccgct actcaaaaac caagaattta aaggagtctc ttaaatttcg accttgtttc 180
tgaagctcac ttttcagtgc cattgatgtg agatgtgctg gagtggctat taaccttttt 240
ttcctaaaga ttattgttaa atagatattg tggtttgggg aagttgaatt ttttataggt 300
taaagtcat ttttagatg gggagaggga ttatactgca ggcagcttca gccatgttgt 360
gaaactgata aaagcaactt agcaaggctt cttttcatta ttttttatgt ttcacttata 420
aagtcttagg taactagtag gatagaaaca ctgtgtcccg agagtaagga gagaagctac 480
tattgattag agcc                                     494
```

<210> 450

<211> 547

<212> DNA

<213> Homo sapiens

<400> 450

```
actttgggct ccagacttca ctgtccttag gcattgaaac catcacctgg tttgcattct 60
tcatgactga ggttaactta aaacaaaaat ggtaggaaag ctttcctatg cttcgggtaa 120
gagacaaatt tgcttttgta gaattggtgg ctgagaaagg cagacagggc ctgattaaag 180
aagacatttg tcaccactag ccaccaagtt aagttgtgga acccaaaggt gacggccatg 240
gaaacgtaga tcatcagctc tgctaagtag ttaggggag aaacatattc aaaccagtct 300
ccaaatggga tcctgtgggt acagtgaatg gccactcctg ctttattttt cctgagattg 360
ccgagaataa catggcactt atactgatgg gcagatgacc agatgaacat catcatccca 420
agaatatgga accaccgtgc ttgcatcaat agatttttcc ctgttatgta ggcattcctg 480
ccatccattg gcacttggct cagcacagtt aggccaacaa ggacataata gacaagtcca 540
aaacagt                                     547
```

<210> 451

<211> 384

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(384)

<223> n = A,T,C or G

<400> 451

```
actacttntt gggttaaaang ccactggtag agtcatctga ntgtaaaciaa tgtccctgca 60
ctgctggaaa aatccactgg ctccaagaa aagaaaatgg tctgaagcct ctgttggtgc 120
tctcacaact catctttccc taagtcacat agctccacat cactgaggtc aatgtcatcc 180
tccacgggaa gctcgccatc cctgccgtcc caaggtcttc tctcaacgat ggtagggaaa 240
gccccgcctc ctacaggtgc cgtggagcca cgcacaaaag agagctccct gagaaactcg 300
ttgatgcctt gctcactgaa ggagcctttt agcagagcaa atttcatctt gcgtgcattg 360
atggcggcca tggcggggta ccca 384
```

<210> 452

<211> 381

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(381)

<223> n = A,T,C or G

<400> 452

```
actctaaagt tgccactctc acaggggtca gtgataccca ctgaacctgg caggaacagt 60
cctgcagcca gaatctgcaa gcagcgcttg tatgcaacgt ttagggccaa aggctgtctg 120
gtggggttgt tcatcacagc ataatggcct agtaggtcaa ggatccaggg tgtgaggggc 180
tcaaagccag gaaaacgaat cctcaagtcc ttcagtagtc tgatgagaac ttttaactgtg 240
gactgagaag cattttcctc gaaccagcgg gcatgtcgga tggctgctaa ngcactctgc 300
aatactttga tatccaaatg gagttctgga tccagttttc naagattggg tggcactgtt 360
gtaatganaa tcttcactgt a 381
```

<210> 453

<211> 455

<212> DNA

<213> Homo sapiens

<400> 453

```
actgtgctaa acagcctata gccaaagtttt aaagagttac aggaacaact gctacacatt 60
caaagaacag gcattcactg cagcctcctg atttgacctg atgggagggg caggagaatg 120
agtcactctg ccaccacttt tcttgccctg gattttaga ggatttgttt tgccttaatt 180
tgtttttctt atatctgccc tactaaggta cacagtctgg gcactttgaa aatgttaaaag 240
tttttaacgt ttgactgaca gaagcagcac tttaaaggctt catgaatcta ttttccaaaa 300
aaagtatgct ttcagtaaaa cattttacca ttttatctaa ctatgcactg acatttttgt 360
tcttcttgaa aaggggattt atgctaacac tgtattttta atgtaaaaat atacgtgtag 420
agatatttta acttcctgag tgacttatac ctcaa 455
```

<210> 454

<211> 383

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(383)

<223> n = A,T,C or G

<400> 454

```
acagagcanc tttacaagtt gtcacatttc tttataaatt tttttaaaagc tacagtttaa 60
tacaaaaatga attgcggttt tattacatta ataacctttc acctcagggt tttatgaaga 120
ggaaagggtt ttatgcaaaa gaaagtgtta caattcctaa tcatttttaga cacttttagga 180
gggggtgaag ttgtatgata aagcagatat ttttaattatt tggtatcttt ttgtattgca 240
agaaatttct tgctagtga tcaagaaaac atccagattg acagtctaaa atggctactg 300
gtatttttagt taattcaaaa atgaaacttt tcagtgttcc actttactaa cattctattt 360
gagaaggctt attggttaaag ttt                                     383
```

<210> 455

<211> 383

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(383)

<223> n = A,T,C or G

<400> 455

```
actcctttan gacaaggaaa cagggtatcag catgatggta gcagaaacct tatcaccaag 60
gtgcaggagc tgacttcttc caaagagttg tggttccggg cagcgggtcat tgccgtgccc 120
attgctggag ggctgatttt agtgttgctt attatgttgg ccctgaggat gcttcgaagt 180
gaaaataaga ggctgcagga tcagcggcaa cagatgctct cccgtttgca ctacagcttt 240
cacggacacc attccaaaaa ggggcaggtt gcaaagttag acttggaatg catgggtccg 300
gtcagtgggc acgagaactg ctgtctgacc tgtgataaaa tgagacaagc agacctcagc 360
aacgataaga tcctctcgct tgt                                     383
```

<210> 456

<211> 543

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(543)

<223> n = A,T,C or G

<400> 456

```
acaaacattt tacaaaaaag aacattacca atatcagtg gtagtaagggc aagctgaaga 60
atangtagac tgagtttccg ggcaatgtct gtcctcaaag acatccaaac tgcgttcagg 120
cagctgaaac aggttctttt cccagtgaac agcatatgtg gtcagtaata caaacgatgg 180
taaagtgggc tactacatag gccagtttaa caaactcctc ttctcctcgg tagggccatg 240
atacaagtgg aactcatcaa ataatttaaa cccaaggcga taacaacact atttcccatc 300
taaactcatt taagccttca caatgtcgca atggattcag ttacttgcaa acgatccccg 360
gttgctacac agatacttgt tttttacaca taacgctgtg ccatcccttc cttcactgcc 420
ccagtcagggt ttctgttgtt tggaccgaaa ggggatacat tttagaaatg cttccctcaa 480
gacagaagtg agaaagaaag gagaccctga ggccaggatc tattaacact ggtgtgtgcy 540
caa                                     543
```

<210> 457

<211> 544

<212> DNA

<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(544)
<223> n = A,T,C or G

<400> 457
actggtgcca atattgncat ggtgagctcc tctctaattgt cttccagggc accaatatct 60
gcccattgtca cattagggac agtgacaaag ccttcccttt tggcagaggg ttggactgag 120
gatagagcaa caatgaaatc attcagttca atgcacagtc cttgcatctg ctccctctgag 180
aggggatctt ggtctcttag caacccagc agccttttga attcactctg tgtttcagaa 240
gtgggctcag ttcccagcct ttcctcctgg actccttttag atggcaaadc ttccatttca 300
ggatttttct tctgctgttc ctgtagcttc attaagactc tattgactgc acacattgct 360
gcctctcggc acagtgccat gagatcagca ccaacaaagc ctggagttag gtgtgctaag 420
tgacagaaat caaaagcttg aggaagcctc agttttctgc acaatgtttg aagtattctt 480
tccctggatg cttcatctgg gatacctagg catattttctc ggtcgaacct tcccgacagt 540
ctca 544

<210> 458
<211> 382
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(382)
<223> n = A,T,C or G

<400> 458
acctntaggc tcaacggcag aancttcacc acaaaagcga aatgggcaca ccacagggag 60
aaaactgggt gtccctggatg ttgaaaagt tggctggtgt catggtgtgt tacttcatcc 120
tatctatcat taactccatg gcacaaagt atgccaacg aatccagcag cggttgaact 180
cagaggagaa aactaaataa gttagagaaag ttttaaactg cagaaattgg agtggatggg 240
ttctgcctta aattgggagg actccaagcc gggaaggaaa attccctttt ccaacctgta 300
tcaattttta caactttttt cctgaaagca gtttagtcca tactttgcac tgacatactt 360
tttcttctg tgctaaggta ag 382

<210> 459
<211> 168
<212> DNA
<213> Homo sapiens

<400> 459
ctcgactct agccaggcac gaaaccatga agtagcctga tccttcttag ccactcctggc 60
cgccttagcg gtagtaactt tgtgttatga atcacatgaa agcatggaat cttatgaact 120
taatcccttc attaacagga gaaatgcaaa taccttcata tcccctca 168

<210> 460
<211> 190
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(190)

<223> n = A,T,C or G

<400> 460

```
acancgtgcta ccagggagcc gagagctgac tatcccagcc tcggctaatag tattctacgc 60
catggatgga gcttcacacg atttcctcct gcggcagcgg cgaaggctcct ctactgctac 120
acctggcgtc accagtggcc cgtctgcctc aggaactcct ccgagtggagg gaggaggggg 180
ctcctttccc                                     190
```

<210> 461

<211> 495

<212> DNA

<213> Homo sapiens

<400> 461

```
acagacaggc ttctctgcta tcctccaggc agtgtaatag tcaaggaaaa gggcaacagt 60
attggatcat tccttagaca ctaatcagct ggggaaagag ttcattggca aaagtgtcct 120
cccaagaatg gtttacacca agcagagagg acatgtcact gaatggggaa agggaaacccc 180
cgtatccaca gtcactgtaa gcatccagta ggcaggaaga tggctttggg cagtggctgg 240
atgaaagcag atttgagata ccagctccg gaacgaggtc atcttctaca ggttcttcct 300
tctactgagac aatgaattca gggatgatcat tctctgaggg gctgagaggt gcttcctcga 360
ttttcactac cacattagct tggctctctg tctcagaggg tatctctaag actaggggct 420
tgggtatatat gtggtcacaaa cgaattagtt cattaatggc ttccagcttg gctgatgacg 480
tccccactga cagag                                     495
```

<210> 462

<211> 493

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(493)

<223> n = A,T,C or G

<400> 462

```
acactgaaac ataaatccgc aagtcaccac acatacaaca cccggcagga aaaaaacaaa 60
aacagggngt ttacatgatc cctgtaacag ccattggctc aaactcagat gcttcctcca 120
tctgccaaat gtgttttggg tacagagcac atcgtggctt ctgggggtcac actcagctta 180
ggctgtgggt ccacagagca ctcatctggc tgggctatgg tgggtggggc tctactcaag 240
aagcaaagca gttaccagca cattcaaaca gtgtattgaa catcttttaa atatcaaagt 300
gagaaacaag aaggcaacat aataatgtta tcagaaaagat gttagggaagt aaggacagct 360
gtgtaaaagc tgaggctgaa aagtagcttg ccagcttcac ttctttgggt tcttgggtag 420
tggggtccgg aacagcaaga tgtgaggttc tgggttcattg atcatataat ggacccatcc 480
ctgactctgc tga                                     493
```

<210> 463

<211> 3681

<212> DNA

<213> Homo sapiens

<400> 463

```
tccgagctga ttacagacac caaggaagat gctgtaaaga gtcagcagcc acagccctgg 60
ctagctggcc ctgtgggcat ttattagtaa agttttaatg acaaaagctt tgagtcaaca 120
caccgtggg taattaacct ggtcatcccc accctggaga gccatcctgc ccatgggtga 180
tcaaagaagg aacatctgca ggaacacctg atgaggctgc acccttggcg gaaagaacac 240
```

```

ctgacacagc tgaaagcttg gtggaaaaaa cacctgatga ggctgcaccc ttggtggaaa 300
gaacacctga caccgctgaa agcttggtgg aaaaaacacc tgatgaggct gcatccttgg 360
tggagggaac atctgacaaa attcaatgtt tggagaaagc gacatctgga aagttcgaac 420
agtcagcaga agaaacacct agggaaatta cgagtcctgc aaaagaaaca tctgagaaat 480
ttacgtggcc agcaaaagga agacctagga agatcgcatg ggagaaaaaa gaagacacac 540
ctagggaaat tatgagctcc gcaaaagaaa catctgagaa atttacgtgg gcagcaaaag 600
gaagacctag gaagatcgca tgggagaaaa aagaaacacc tgtaaagact ggatgctgg 660
caagagtaac atctaataaa actaaagtct tggaaaaagg aagatctaag atgattgcat 720
gtcctacaaa agaatcatct acaaaagcaa gtgccaatga tcagaggttc ccatcagaat 780
ccaaacaaga ggaagatgaa gaatatctct gtgattctcg gagtctcttt gagagtcttg 840
caaagattca agtgtgtata cctgagtcta tatatcaaaa agtaatggag ataaatagag 900
aagtagaaga gcctcctaag aagccatctg ccttcaagcc tgccattgaa atgcaaaact 960
ctgttccaaa taaagccttt gaattgaaga atgaacaaac attgagagca gatccgatgt 1020
tcccaccaga atccaaacaa aaggactatg aagaaaattc ttgggattct gagagtctct 1080
gtgagactgt ttcacagaag gatgtgtgtt tacccaaggc tacacatcaa aaagaaatag 1140
ataaaataaa tggaaaatta gaagagtctc ctaataaaga tggctcttctg aaggctacct 1200
gcggaatgaa agtttctatt ccaactaaag ccttagaatt gaaggacatg caaactttca 1260
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agactgtttc acagaaggat gtgtgtttac ccaaggctrc rcatcaaaaa gaaatagata 1500
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gaatgaaagt ttctattcca actaaagcct tagaattgat ggacatgcaa actttcaaag 1620
cagagcctcc cgagaagcca tctgccttcg agcctgccat tgaaatgcaa aagtctgttc 1680
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cagaatccaa acaaaaggac tatgaagaaa gttcttggga ttctgagagt ctctgtgaga 1800
ctgtttcaca gaaggatgtg tgtttaccba aggctrcrca tcaaaaagaa atagataaaa 1860
taaagtgaaa attagaagag tctcctgata atgatggttt tctgaaggct ccctgcagaa 1920
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aatcaaaaca aaagaasgtt gaagaaaatt cttgggattc tgagagtctc cgtgagactg 2160
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aaagagcaag ggaacttcaa aaagatcact gtgaacaacg tacaggaaaa atggaacaaa 2340
tgaaaaagaa gttttgtgta ctgaaaaaga aactgtcaga agcaaaaagaa ataaaatcac 2400
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tcatgaaaat gaaaattatc tcttacatga aaattgcatg ttgaaaaagg aaattgccat 2520
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tctaagagaa aatacattgg tttcagaaca tgcacaaaga gaccaacgtg aaacacagt 3060
tcaaatgaag gaagctgaac acatgtatca aaacgaaca gataatgtga acaaacacac 3120
tgaacagcag gagtctctag atcagaaatt atttcaacta caaagcaaaa atatgtggct 3180
tcaacagcaa ttagtccatg cacataagaa agctgacaac aaaagcaaga taacaattga 3240
tattcatctt cttgagagga aaatgcaaca tcattctcta aaagagaaaa atgaggagat 3300
atttaattac aataaccatt taaaaaccg tatatatcaa tatgaaaaag agaaagcaga 3360
aacagaaaac tcatgagaga caagcagtaa gaaacttctt ttggagaaac aacagaccag 3420
atctttactc acaactcatg ctaggaggcc agtcctagca tcaccttatg ttgaaaatct 3480
taccaatagt ctgtgtcaac agaatactta ttttagaaga aaaattcatg atttcttctt 3540

```

gaagcctaca gacataaaat aacagtgtga agaattactt gttcacgaat tgcataaagc 3600
 tgcacaggat tcccatctac cctgatgatg cagcagacat cattcaatcc aaccagaatc 3660
 tcgctctgtc actcaggctg g 3681

<210> 464

<211> 1424

<212> DNA

<213> Homo sapiens

<400> 464

tccgagctga ttacagacac caaggaagat gctgtaaaga gtcagcagcc acagccctgg 60
 ctgctgggcc ctgtgggcat ttattagtaa agttttaatg acaaaagctt tgagtcaaca 120
 caccctgggg taattaacct ggtcatcccc accctggaga gccatcctgc ccatgggtga 180
 tcaaagaagg aacatctgca ggaacacctg atgaggctgc acccttggcg gaaagaacac 240
 ctgacacagc tgaaagcttg gtggaaaaaa cacctgatga ggctgcaccc ttggtggaaa 300
 gaacacctga cagggctgaa agcttgggtg aaaaaacacc tgatgaggct gcaccccttg 360
 tggaggggaa atctgacaaa attcaatgtt tggagaaaag gacatctgga aagttcgaac 420
 agtcagcaga agaaacacct agggaaatta cgagtcctgc aaaagaaaaca tctgagaaat 480
 ttacgtggcc agcaaaagga agacctagga agatcgcatg ggagaaaaaa gaagacacac 540
 ctagggaat tatgagctcc gcaaaagaaa catctgagaa atttacgtgg gcagcaaaag 600
 gaagacctag gaagatcgca tgggagaaaa aagaaacacc tgtaaagact ggatgcgtgg 660
 caagagtaac atctaataaa actaaagtgt tggaaaaagg aagatctaag atgattgcat 720
 gtcctacaaa agaatcatct acaaaagcaa gtgccaatga tcagaggttc ccacagaat 780
 ccaacaaga ggaagatgaa gaatattctt gtgattctct gagtctcttt gagagttctg 840
 caaagattca agtgtgtata cctgagtcta tatatcaaaa agtaatggag ataaatagag 900
 aagtagaaga gcctcctaag aagccatctg ccttcaagcc tgccattgaa atgcaaaact 960
 ctgttccaaa taaagccttt gaattgaaga atgaacaaac attgagagca gatccgatgt 1020
 tcccaccaga atccaaacaa aaggactatg aagaaaattc ttgggattct gagagtctct 1080
 gtgagactgt ttacagaag gatgtgtgtt tacccaaggc tacacatcaa aaagaaatag 1140
 ataaaataaa tggaaaatta gaaggtaaga accgtttttt atttaaaaat cagttgaccg 1200
 aatattttct taaactgatg aggagggata tcctctagta gctgaagaaa attacctcct 1260
 aaatgcaaac catggaaaaa aagagaagtg caatggctgt aagttgtatg tctcatcagg 1320
 tgttggaac agactatatt gagagtgtg aaaaaggagct gaattattag tttgaattca 1380
 agatattgca agacctgaga gaaaaaaaaa aaaaaaaaaa aaaa 1424

<210> 465

<211> 674

<212> DNA

<213> Homo sapiens

<400> 465

attccgagct gattacagac accaaggaag atgctgtaaa gagtcagcag ccacagccct 60
 ggctagctgg cctgtgggc atttattagt aaagttttaa tgacaaaagc tttgagtcaa 120
 cacacccgtg ggtaattaac ctggatcatc ccaccctgga gagccatcct gccatgggt 180
 gatcaaagaa ggaacatctg caggaacacc tgatgaggct gcacccttgg cggaaagaac 240
 acctgacaca gctgaaagct tgggtgaaaa aacacctgat gaggtgcac ccttgggtgga 300
 aagaacacct gacacggctg aaagcttgggt ggaaaaaaca cctgatgagg ctgcacccct 360
 ggtggaggga acatctgaca aaattcaatg tttggagaaa gcgacatctg gaaagttcga 420
 acagtcagca gaagaaacac ctagggaat tacgagtcct gcaaaagaaa catctgagaa 480
 atttacgtgg ccagcaaaag gaagacctag gaagatcgca tgggagaaaa aagatgactc 540
 agttaaggca aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 600
 aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 660
 aaaaaaaaaa aaaa 674

<210> 466

140

<211> 1729
 <212> DNA
 <213> Homo sapiens

<220>
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 <222> (11)
 <223> n=A,T,C or G
 <221> unsure
 <222> (1128)
 <223> n=A,T,C or G

<400> 466
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 aagaagacac acctagggaa attatgagtc ccgcaaaaaga aacatctgag aaattttacgt 180
 gggcagcaaa aggaagacct aggaagatcg catgggagaa aaaagaaaca cctgtaaaaga 240
 ctggatgctg ggcaagagta acatctaata aaactaaagt tttggaaaaa ggaagatcta 300
 agatgattgc atgtcctaca aaagaatcat ctacaaaagc aagtgccaat gatcagaggt 360
 tcccatcaga atccaaacaa gaggaagatg aagaatatct ttgtgattct cggagtctct 420
 ttgagagtct tgcaaaagatt caagtgtgta tacctgagtc tatatatcaa aaagtaattg 480
 agataaatag agaagtagaa gagcctccta agaagccatc tgccttcaag cctgccattg 540
 aaatgcaaaa ctctgttcca aataaagcct ttgaattgaa gaatgaacaa acattgagag 600
 cagatccgat gttcccacca gaatccaaac aaaaggacta tgaagaaaaa tcttgggatt 660
 ctgagagtct ctgtgagact gtttcacaga aggatgtgtg tttacccaag gctacacatc 720
 aaaaagaaat agataaaaata aatggaaaat tagaagagtc tcctaataaa gatggctctc 780
 tgaaggctac ctgcggaatg aaagtttcta ttccaactaa agccttagaa ttgaaggaca 840
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 aagaaataga taaaataaat ggaaaattag aaggggtctcc tggtaaanat ggtcttctga 1140
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 tgaccaataa tttctctaaa ttgatgagga aggatattct ctagtagctg aagaaaatta 1560
 cctcctaaat gcaaacatg gaaaaaaaaga gaagtgcaat ggtcataagc tatgtgtctc 1620
 atcaggcatt ggcaacagac tatattgtga gtgctgaaga ggagctgaat tactagttta 1680
 aattcaagat attccaagac gtgaggaaaa tgagaaaaaa aaaaaaaaaa 1729

<210> 467
 <211> 1337
 <212> DNA
 <213> Homo sapiens

<400> 467
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 tgcaaaacttt caaagcagag cctcccgaga agccatctgc ctctgagcct gccattgaaa 180
 tgcaaaagtc tgttccaaat aaagccttgg aattgaagaa tgaacaaaca ttgagagcag 240
 atgagatact cccatcagaa tccaaacaaa aggactatga agaaagttct tgggattctg 300
 agagtctctg tgagactggt tcacagaagg atgtgtgttt acccaaggct gcgcatcaaa 360


```

aagaaataga taaaataaat ggaaaattag aagagtctcc tgataatgat ggttttctga 420
aggctccctg cagaatgaaa gtttctattc caactaaagc cttagaattg atggacatgc 480
aaactttcaa agcagagcct cccgagaagc catctgcctt cgagcctgcc attgaaatgc 540
aaaagtctgt tccaaataaa gccttggaat tgaagaatga acaaacattg agagcagatc 600
agatgttccc ttcagaatca aaacaaaaga aggttgaaga aaattcttgg gattctgaga 660
gtctccgtga gactgtttca cagaaggatg tgtgtgtacc caaggctaca catcaaaaag 720
aatggataa aataagtgga aaattagaag attcaactag cctatcaaaa atcttggata 780
cagttcattc ttgtgaaaga gcaagggaac ttcaaaaaga tctactgtga caacgtacag 840
gaaaaatgga acaaatgaaa aagaagtgtt gtgtactgaa aaagaaactg tcagaagcaa 900
aagaaataaa atcacagtta gagaaccaaa agtttaaag ggaacaagag ctctgcagt 960
tgagattgac tttaaaccaa gaagaagaga agagaagaaa tgccgatata ttaaataaaa 1020
aaattaggga agaattagga agaatacga agcagcatag gaaagagtta gaagtgaac 1080
aacaacttga acaggctctc agaatacaag atatagaatt gaagagtgtg gaaagtaatt 1140
tgaatcaggt ttctcacact catgaaaatg aaaattatct cttacatgaa aattgcatgt 1200
tgaaaaagga aattgccatg ctaaaactgg aaatagccac actgaaacac caataccagg 1260
aaaaggaaaa taaatacttt gagggacatta agattttaaa agaaaagaat gctgaacttc 1320
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<210> 468

<211> 2307

<212> DNA

<213> Homo sapiens

<400> 468

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tacacatcaa aaagaaatag ataaaataaa tggaaaatta gaagggtctc ctgttaaaga 180
tggtcttctg aaggctaact gcggaatgaa agtttctatt ccaactaaag ccttagaatt 240
gatggacatg caaactttca aagcagagcc tcccgagaag ccatctgcct tcgagcctgc 300
cattgaaatg caaaagtctg ttccaaataa agccttggaa ttgaagaatg aacaaacatt 360
gagagcagat gagatactcc catcagaatc caaacaaga gactatgaag aaagtctctg 420
ggattctgag agtctctgtg agactgtttc acagaaggat gtgtgtttac ccaaggctac 480
acatcaaaaa gaaatagata aaataaatgg aaaattagaa gagtctcctg ataattgatg 540
ttttctgaag tctccctgca gaatgaaagt ttctattcca actaaagcct tagaattgat 600
ggacatgcaa actttcaaag cagagcctcc cgagaagcca tctgccttcg agcctgccat 660
tgaaatgcaa aagtctgttc caaataaagc ttggaattg aagaatgaac aaacattgag 720
agcagatcag atgttccctt cagaatcaaa acaaaagaac gttgaagaaa attcttggga 780
ttctgagagt ctccgtgaga ctgtttcaca gaaggatgtg tgtgtaccca aggctacaca 840
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agaagcaaaa gaaataaaat cacagttaga gaaccaaaaa gttaaatggg aacaagagct 1080
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caagataatg tgaacaaaca cactgaacag caggagtctc tagatcagaa attatttcaa 1800
ctacaaagca aaaatatgtg gcttcaacag caattagttc atgcacataa gaaagctgac 1860

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aacaaaagca agataacaat tgatattcat tttcttgaga ggaaaatgca acatcatctc 1920
ctaaaagaga aaaatgagga gatatttaac tacaataacc atttaaaaaa ccgtatatat 1980
caatatgaaa aagagaaaagc agaaacagaa aactcatgag agacaagcag taagaaactt 2040
cttttgagga aacaacagac cagatcttta ctcaactc atgctaggag gccagtccta 2100
gcacacacct atgttgaaaa tcttaccat agtctgtgtc aacagaatac ttattttaga 2160
agaaaaattc atgatttctt cctgaagcct acagacataa aataacagtg tgaagaatta 2220
cttggtcacg aattgcataa agctgcacag gattcccatc taccctgatg atgcagcaga 2280
catcattcaa tccaaccaga atctcgc                                     2307

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<210> 469

<211> 650

<212> PRT

<213> Homo sapiens

<220>

<221> unsure

<222> (310)

<223> Xaa = Any Amino Acid<221> unsure

<222> (429)

<223> Xaa = Any Amino Acid<221> unsure

<222> (522)

<223> Xaa = Any Amino Acid

<400> 469

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Met Ser Pro Ala Lys Glu Thr Ser Glu Lys Phe Thr Trp Ala Ala Lys
              5              10              15

```

```

Gly Arg Pro Arg Lys Ile Ala Trp Glu Lys Lys Glu Thr Pro Val Lys
              20              25              30

```

```

Thr Gly Cys Val Ala Arg Val Thr Ser Asn Lys Thr Lys Val Leu Glu
              35              40              45

```

```

Lys Gly Arg Ser Lys Met Ile Ala Cys Pro Thr Lys Glu Ser Ser Thr
              50              55              60

```

```

Lys Ala Ser Ala Asn Asp Gln Arg Phe Pro Ser Glu Ser Lys Gln Glu
              65              70              75              80

```

```

Glu Asp Glu Glu Tyr Ser Cys Asp Ser Arg Ser Leu Phe Glu Ser Ser
              85              90              95

```

```

Ala Lys Ile Gln Val Cys Ile Pro Glu Ser Ile Tyr Gln Lys Val Met
              100              105              110

```

```

Glu Ile Asn Arg Glu Val Glu Glu Pro Pro Lys Lys Pro Ser Ala Phe
              115              120              125

```

```

Lys Pro Ala Ile Glu Met Gln Asn Ser Val Pro Asn Lys Ala Phe Glu
              130              135              140

```

```

Leu Lys Asn Glu Gln Thr Leu Arg Ala Asp Pro Met Phe Pro Pro Glu
              145              150              155              160

```

```

Ser Lys Gln Lys Asp Tyr Glu Glu Asn Ser Trp Asp Ser Glu Ser Leu

```

143

	165		170		175
Cys Glu Thr Val Ser Gln Lys Asp Val Cys Leu Pro Lys Ala Thr His	180	185	190		
Gln Lys Glu Ile Asp Lys Ile Asn Gly Lys Leu Glu Glu Ser Pro Asn	195	200	205		
Lys Asp Gly Leu Leu Lys Ala Thr Cys Gly Met Lys Val Ser Ile Pro	210	215	220		
Thr Lys Ala Leu Glu Leu Lys Asp Met Gln Thr Phe Lys Ala Glu Pro	225	230	235	240	
Pro Gly Lys Pro Ser Ala Phe Glu Pro Ala Thr Glu Met Gln Lys Ser	245	250	255		
Val Pro Asn Lys Ala Leu Glu Leu Lys Asn Glu Gln Thr Leu Arg Ala	260	265	270		
Asp Glu Ile Leu Pro Ser Glu Ser Lys Gln Lys Asp Tyr Glu Glu Ser	275	280	285		
Ser Trp Asp Ser Glu Ser Leu Cys Glu Thr Val Ser Gln Lys Asp Val	290	295	300		
Cys Leu Pro Lys Ala Xaa His Gln Lys Glu Ile Asp Lys Ile Asn Gly	305	310	315	320	
Lys Leu Glu Gly Ser Pro Val Lys Asp Gly Leu Leu Lys Ala Asn Cys	325	330	335		
Gly Met Lys Val Ser Ile Pro Thr Lys Ala Leu Glu Leu Met Asp Met	340	345	350		
Gln Thr Phe Lys Ala Glu Pro Pro Glu Lys Pro Ser Ala Phe Glu Pro	355	360	365		
Ala Ile Glu Met Gln Lys Ser Val Pro Asn Lys Ala Leu Glu Leu Lys	370	375	380		
Asn Glu Gln Thr Leu Arg Ala Asp Glu Ile Leu Pro Ser Glu Ser Lys	385	390	395	400	
Gln Lys Asp Tyr Glu Glu Ser Ser Trp Asp Ser Glu Ser Leu Cys Glu	405	410	415		
Thr Val Ser Gln Lys Asp Val Cys Leu Pro Lys Ala Xaa His Gln Lys	420	425	430		
Glu Ile Asp Lys Ile Asn Gly Lys Leu Glu Glu Ser Pro Asp Asn Asp	435	440	445		
Gly Phe Leu Lys Ala Pro Cys Arg Met Lys Val Ser Ile Pro Thr Lys	450	455	460		

144

Ala Leu Glu Leu Met Asp Met Gln Thr Phe Lys Ala Glu Pro Pro Glu
465 470 475 480

Lys Pro Ser Ala Phe Glu Pro Ala Ile Glu Met Gln Lys Ser Val Pro
485 490 495

Asn Lys Ala Leu Glu Leu Lys Asn Glu Gln Thr Leu Arg Ala Asp Gln
500 505 510

Met Phe Pro Ser Glu Ser Lys Gln Lys Xaa Val Glu Glu Asn Ser Trp
515 520 525

Asp Ser Glu Ser Leu Arg Glu Thr Val Ser Gln Lys Asp Val Cys Val
530 535 540

Pro Lys Ala Thr His Gln Lys Glu Met Asp Lys Ile Ser Gly Lys Leu
545 550 555 560

Glu Asp Ser Thr Ser Leu Ser Lys Ile Leu Asp Thr Val His Ser Cys
565 570 575

Glu Arg Ala Arg Glu Leu Gln Lys Asp His Cys Glu Gln Arg Thr Gly
580 585 590

Lys Met Glu Gln Met Lys Lys Lys Phe Cys Val Leu Lys Lys Lys Leu
595 600 605

Ser Glu Ala Lys Glu Ile Lys Ser Gln Leu Glu Asn Gln Lys Val Lys
610 615 620

Trp Glu Gln Glu Leu Cys Ser Val Arg Phe Leu Thr Leu Met Lys Met
625 630 635 640

Lys Ile Ile Ser Tyr Met Lys Ile Ala Cys
645 650

<210> 470

<211> 228

<212> PRT

<213> Homo sapiens

<400> 470

Met Ser Pro Ala Lys Glu Thr Ser Glu Lys Phe Thr Trp Ala Ala Lys
5 10 15

Gly Arg Pro Arg Lys Ile Ala Trp Glu Lys Lys Glu Thr Pro Val Lys
20 25 30

Thr Gly Cys Val Ala Arg Val Thr Ser Asn Lys Thr Lys Val Leu Glu
35 40 45

Lys Gly Arg Ser Lys Met Ile Ala Cys Pro Thr Lys Glu Ser Ser Thr
50 55 60

145

Lys Ala Ser Ala Asn Asp Gln Arg Phe Pro Ser Glu Ser Lys Gln Glu
 65 70 75 80
 Glu Asp Glu Glu Tyr Ser Cys Asp Ser Arg Ser Leu Phe Glu Ser Ser
 85 90 95
 Ala Lys Ile Gln Val Cys Ile Pro Glu Ser Ile Tyr Gln Lys Val Met
 100 105 110
 Glu Ile Asn Arg Glu Val Glu Glu Pro Pro Lys Lys Pro Ser Ala Phe
 115 120 125
 Lys Pro Ala Ile Glu Met Gln Asn Ser Val Pro Asn Lys Ala Phe Glu
 130 135 140
 Leu Lys Asn Glu Gln Thr Leu Arg Ala Asp Pro Met Phe Pro Pro Glu
 145 150 155 160
 Ser Lys Gln Lys Asp Tyr Glu Glu Asn Ser Trp Asp Ser Glu Ser Leu
 165 170 175
 Cys Glu Thr Val Ser Gln Lys Asp Val Cys Leu Pro Lys Ala Thr His
 180 185 190
 Gln Lys Glu Ile Asp Lys Ile Asn Gly Lys Leu Glu Gly Lys Asn Arg
 195 200 205
 Phe Leu Phe Lys Asn Gln Leu Thr Glu Tyr Phe Ser Lys Leu Met Arg
 210 215 220
 Arg Asp Ile Leu
 225

<210> 471
 <211> 154
 <212> PRT
 <213> Homo sapiens

<220>
 <221> unsure
 <222> (148)
 <223> Xaa = Any Amino Acid

<400> 471
 Met Arg Leu His Pro Trp Arg Lys Glu His Leu Thr Gln Leu Lys Ala
 5 10 15
 Trp Trp Lys Lys His Leu Met Arg Leu His Pro Trp Trp Lys Glu His
 20 25 30
 Leu Thr Arg Leu Lys Ala Trp Trp Lys Lys His Leu Met Arg Leu His
 35 40 45

146

Pro Trp Trp Arg Glu His Leu Thr Lys Phe Asn Val Trp Arg Lys Arg
 50 55 60
 His Leu Glu Ser Ser Asn Ser Gln Gln Lys Lys His Leu Gly Lys Leu
 65 70 75 80
 Arg Val Leu Gln Lys Lys His Leu Arg Asn Leu Arg Gly Gln Gln Lys
 85 90 95
 Glu Asp Leu Gly Arg Ser His Gly Arg Lys Lys Met Thr Gln Leu Arg
 100 105 110
 Gln Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys
 115 120 125
 Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys
 130 135 140
 Lys Lys Lys Xaa Lys Lys Lys Lys Lys Lys
 145 150

<210> 472

<211> 467

<212> PRT

<213> Homo sapiens

<220>

<221> unsure

<222> (329)

<223> Xaa = Any Amino Acid

<400> 472

Met Ser Pro Ala Lys Glu Thr Ser Glu Lys Phe Thr Trp Ala Ala Lys
 5 10 15
 Gly Arg Pro Arg Lys Ile Ala Trp Glu Lys Lys Glu Thr Pro Val Lys
 20 25 30
 Thr Gly Cys Val Ala Arg Val Thr Ser Asn Lys Thr Lys Val Leu Glu
 35 40 45
 Lys Gly Arg Ser Lys Met Ile Ala Cys Pro Thr Lys Glu Ser Ser Thr
 50 55 60
 Lys Ala Ser Ala Asn Asp Gln Arg Phe Pro Ser Glu Ser Lys Gln Glu
 65 70 75 80
 Glu Asp Glu Glu Tyr Ser Cys Asp Ser Arg Ser Leu Phe Glu Ser Ser
 85 90 95
 Ala Lys Ile Gln Val Cys Ile Pro Glu Ser Ile Tyr Gln Lys Val Met
 100 105 110
 Glu Ile Asn Arg Glu Val Glu Glu Pro Pro Lys Lys Pro Ser Ala Phe

147

115	120	125
Lys Pro Ala Ile Glu Met Gln Asn Ser Val Pro Asn Lys Ala Phe Glu 130 135 140		
Leu Lys Asn Glu Gln Thr Leu Arg Ala Asp Pro Met Phe Pro Pro Glu 145 150 155 160		
Ser Lys Gln Lys Asp Tyr Glu Glu Asn Ser Trp Asp Ser Glu Ser Leu 165 170 175		
Cys Glu Thr Val Ser Gln Lys Asp Val Cys Leu Pro Lys Ala Thr His 180 185 190		
Gln Lys Glu Ile Asp Lys Ile Asn Gly Lys Leu Glu Glu Ser Pro Asn 195 200 205		
Lys Asp Gly Leu Leu Lys Ala Thr Cys Gly Met Lys Val Ser Ile Pro 210 215 220		
Thr Lys Ala Leu Glu Leu Lys Asp Met Gln Thr Phe Lys Ala Glu Pro 225 230 235 240		
Pro Gly Lys Pro Ser Ala Phe Glu Pro Ala Thr Glu Met Gln Lys Ser 245 250 255		
Val Pro Asn Lys Ala Leu Glu Leu Lys Asn Glu Gln Thr Leu Arg Ala 260 265 270		
Asp Glu Ile Leu Pro Ser Glu Ser Lys Gln Lys Asp Tyr Glu Glu Asn 275 280 285		
Ser Trp Asp Thr Glu Ser Leu Cys Glu Thr Val Ser Gln Lys Asp Val 290 295 300		
Cys Leu Pro Lys Ala Ala His Gln Lys Glu Ile Asp Lys Ile Asn Gly 305 310 315 320		
Lys Leu Glu Gly Ser Pro Gly Lys Xaa Gly Leu Leu Lys Ala Asn Cys 325 330 335		
Gly Met Lys Val Ser Ile Pro Thr Lys Ala Leu Glu Leu Met Asp Met 340 345 350		
Gln Thr Phe Lys Ala Glu Pro Pro Glu Lys Pro Ser Ala Phe Glu Pro 355 360 365		
Ala Ile Glu Met Gln Lys Ser Val Pro Asn Lys Ala Leu Glu Leu Lys 370 375 380		
Asn Glu Gln Thr Leu Arg Ala Asp Glu Ile Leu Pro Ser Glu Ser Lys 385 390 395 400		
Gln Lys Asp Tyr Glu Glu Ser Ser Trp Asp Ser Glu Ser Leu Cys Glu 405 410 415		

148

Thr Val Ser Gln Lys Asp Val Cys Leu Pro Lys Ala Ala His Gln Lys
420 425 430

Glu Ile Asp Lys Ile Asn Gly Lys Leu Glu Gly Lys Asn Arg Phe Leu
435 440 445

Phe Lys Asn His Leu Thr Lys Tyr Phe Ser Lys Leu Met Arg Lys Asp
450 455 460

Ile Leu
465

<210> 473

<211> 445

<212> PRT

<213> Homo sapiens

<400> 473

Lys Glu Ile Asp Lys Ile Asn Gly Lys Leu Glu Gly Ser Pro Val Lys
5 10 15

Asp Gly Leu Leu Lys Ala Asn Cys Gly Met Lys Val Ser Ile Pro Thr
20 25 30

Lys Ala Leu Glu Leu Met Asp Met Gln Thr Phe Lys Ala Glu Pro Pro
35 40 45

Glu Lys Pro Ser Ala Phe Glu Pro Ala Ile Glu Met Gln Lys Ser Val
50 55 60

Pro Asn Lys Ala Leu Glu Leu Lys Asn Glu Gln Thr Leu Arg Ala Asp
65 70 75 80

Glu Ile Leu Pro Ser Glu Ser Lys Gln Lys Asp Tyr Glu Glu Ser Ser
85 90 95

Trp Asp Ser Glu Ser Leu Cys Glu Thr Val Ser Gln Lys Asp Val Cys
100 105 110

Leu Pro Lys Ala Ala His Gln Lys Glu Ile Asp Lys Ile Asn Gly Lys
115 120 125

Leu Glu Glu Ser Pro Asp Asn Asp Gly Phe Leu Lys Ala Pro Cys Arg
130 135 140

Met Lys Val Ser Ile Pro Thr Lys Ala Leu Glu Leu Met Asp Met Gln
145 150 155 160

Thr Phe Lys Ala Glu Pro Pro Glu Lys Pro Ser Ala Phe Glu Pro Ala
165 170 175

Ile Glu Met Gln Lys Ser Val Pro Asn Lys Ala Leu Glu Leu Lys Asn
180 185 190

149

Glu Gln Thr Leu Arg Ala Asp Gln Met Phe Pro Ser Glu Ser Lys Gln
 195 200 205
 Lys Lys Val Glu Glu Asn Ser Trp Asp Ser Glu Ser Leu Arg Glu Thr
 210 215 220
 Val Ser Gln Lys Asp Val Cys Val Pro Lys Ala Thr His Gln Lys Glu
 225 230 235 240
 Met Asp Lys Ile Ser Gly Lys Leu Glu Asp Ser Thr Ser Leu Ser Lys
 245 250 255
 Ile Leu Asp Thr Val His Ser Cys Glu Arg Ala Arg Glu Leu Gln Lys
 260 265 270
 Asp His Cys Glu Gln Arg Thr Gly Lys Met Glu Gln Met Lys Lys Lys
 275 280 285
 Phe Cys Val Leu Lys Lys Lys Leu Ser Glu Ala Lys Glu Ile Lys Ser
 290 295 300
 Gln Leu Glu Asn Gln Lys Val Lys Trp Glu Gln Glu Leu Cys Ser Val
 305 310 315 320
 Arg Leu Thr Leu Asn Gln Glu Glu Glu Lys Arg Arg Asn Ala Asp Ile
 325 330 335
 Leu Asn Glu Lys Ile Arg Glu Glu Leu Gly Arg Ile Glu Glu Gln His
 340 345 350
 Arg Lys Glu Leu Glu Val Lys Gln Gln Leu Glu Gln Ala Leu Arg Ile
 355 360 365
 Gln Asp Ile Glu Leu Lys Ser Val Glu Ser Asn Leu Asn Gln Val Ser
 370 375 380
 His Thr His Glu Asn Glu Asn Tyr Leu Leu His Glu Asn Cys Met Leu
 385 390 395 400
 Lys Lys Glu Ile Ala Met Leu Lys Leu Glu Ile Ala Thr Leu Lys His
 405 410 415
 Gln Tyr Gln Glu Lys Glu Asn Lys Tyr Phe Glu Asp Ile Lys Ile Leu
 420 425 430
 Lys Glu Lys Asn Ala Glu Leu Gln Met Thr Pro Arg Ala
 435 440 445

<210> 474

<211> 221

<212> DNA

<213> Homo sapiens

<220>

150

<221> misc_feature
<222> (1)...(221)
<223> n = A,T,C or G

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tcagaagata gggcacagcc attgccttgg cctcacttga agggctctgca ttgggtcct 180
ctggtctctt gccaaagttc ccagccactc gagggagaaa t 221